HOW TO *flourish* IN EVERYDAY LIFE?

Enhancing flourishing mental health in the general
population as a new strategy for the prevention of anxiety
and depressive disorders

Marijke Schotanus-Dijkstra

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MARIJKE SCHOTANUS-DIJKSTRA

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ENHANCING FLOURISHING MENTAL HEALTH IN THE GENERAL
POPULATION AS A NEW STRATEGY FOR THE PREVENTION OF
ANXIETY AND DEPRESSIVE DISORDERS

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Samenstelling promotiecommissie

Promotor:

Prof. dr. E. T. Bohlmeijer (Universiteit Twente)

Copromotoren:

Prof. dr. J. A. Walburg (Universiteit Twente)

Dr. C. H. C. Drossaert (Universiteit Twente)

Leden:

Dr. M. E. Pieterse (Universiteit Twente)

Prof. dr. P. A. Boelen (Universiteit Utrecht)

Prof. dr. F. Smit (Trimbos-instituut, Vrije Universiteit Amsterdam)

Prof. dr. ir. B. P. Veldkamp (Universiteit Twente)

Prof. dr. A. Need (Universiteit Twente)

Prof. dr. G. J. Westerhof (Universiteit Twente)

Voor Florian en Noah

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Chapter 1

General Introduction

Positive psychology: An introduction

Positive psychology is a new and rapidly expanding movement within psychology (Seligman & Csikszentmihalyi, 2000). A frequent misconception of lay persons and clinicians is that positive psychology is all about the positive while neglecting serious and everyday problems (Magyar-Moe, Owens, & Conoley, 2015; Wood & Tarrier, 2010). However, positive psychologists are inclined to integrate both the positive and the negative in research and clinical practice by both repairing the bad and building the good. Another misconception is that the positive equals the absence of the negative (and that the negative equals the absence of the positive). But according to positive psychology this is not the case, as is illustrated by a statement of Seligman and Csikszentmihalyi (2000), based upon the philosophical ideas of Albert Camus: *“One cannot answer [the foremost question of philosophy why one should not commit suicide] just by curing depression; there must be positive reasons for living as well”* (p. 13). In fact, research has shown that most people do not only suffer from a mental disorder but are also not fully functioning (Keyes, 2002; Keyes, 2005). The promotion of the positive in all human beings, whether mentally ill or not, has the potential to (Keyes, 2002; Pawelski, 2016; Seligman & Csikszentmihalyi, 2000) (1) build human flourishing, (2) serve as a buffer against the onset of mental health complaints and mental disorders, (3) positively influence symptoms of mental disorders and thereby prevent worsening of mental health complaints, contribute to faster recovery of mental disorders and prevent relapse.

What is positive psychology? Seligman and Csikszentmihalyi (2000) did not provide a clear definition of positive psychology in their introduction paper of a special issue about this topic. In a later paper, Duckworth, Steen, and Seligman (2005) defined positive psychology as *“the scientific study of positive experiences and positive individual traits, and the institutions that facilitate their development”* (p. 630). Although some may claim that positive psychology is not a novel discipline and that researchers and practitioners erroneously did not recognize the knowledge of what has preceded the founding of this field (Magyar-Moe et al., 2015; Wood & Tarrier, 2010), the introduction of positive psychology around the year 2000 (Seligman & Csikszentmihalyi, 2000) has paved the way for the burgeoning attention on “the positive” as it is today (Rusk & Waters, 2013). As a consequence, specific journals have originated like the Journal of Positive Psychology. According to this journal, *“Positive psychology is about scientifically informed perspectives on what makes life worth living, focusing on aspects of the human condition that lead to happiness, fulfillment, and flourishing”*. This latter concept of “flourishing” is the main theme of the current thesis.

What is flourishing mental health?

According to the Oxford Dictionary, the verb flourish means “(a person, animal or other living organism) that grows or develops in a healthy or vigorous way, especially as the result of a particularly favorable environment”. In psychological research, Corey Keyes (Keyes, 2002) was the first to introduce the concept of flourishing mental health. In his “two continua model”, he claims that mental health is not merely the absence of mental illness but should also epitomize the presence of mental well-being. In other words, people with a mental disorder can also possess flourishing mental health and people with low levels of mental well-being are not automatically diagnosed with a mental disorder. The concept of mental well-being needs some further clarification before I can explain the operationalization of flourishing mental health.

Well-being research has a long-standing history in the field of philosophy and psychology. Ancient Greek philosophers like Aristotle, Aristippus of Cyrene and Epicurus were questioning what constitutes the highest of all goods achievable by personal action. Ethical hedonia and ethical eudaimonia have both been translated into “happiness” albeit those philosophers described different types of happiness (Ryff & Singer, 2008). In psychological science, hedonic well-being is often synonymous for “subjective well-being” or “emotional well-being”, and comprises a judgment about *feeling good* in life. Subjective well-being consists of a positive versus negative affect balance, life-satisfaction and happiness (Diener, 1984) and is mainly focused on pleasure, comfort and enjoyment. Contrarily, eudaimonic well-being is a rather complex concept that often includes psychological well-being (Ryff, 1989) and social well-being (Keyes, 1998), and comprises a judgement about *doing well* in life. According to Aristotle, people should strive eudaimonic-enhancing activities rather than solely hedonic pleasure, although the latter is often an outcome of a eudaimonic activity (Henderson & Knight, 2012). This can be illustrated with an example: Regular physical exercise is likely to contribute to one’s eudaimonic well-being because it will do good to mind and body, but only when he or she actually enjoys the physical workout it will also contribute to one’s hedonic well-being.

Recently, scientists have come to the conclusion that it seems best to integrate both the hedonic and eudaimonic well-being perspectives derived from ancient philosophy into one concept of mental well-being (Henderson & Knight, 2012; Huppert & So, 2013; Kashdan, Biswas-Diener, & King, 2008; Keyes, 2002). Hence, mental well-being incorporates aspects of both hedonic and eudaimonic well-being. **Flourishing mental health is operationalized as having high levels of both hedonic and eudaimonic well-being aspects.** However, not much is known about what exactly constitutes a flourishing mental health status. I will now briefly discuss the main theories of flourishing mental health in order of time of origin.

Human needs theories

The scientific study of flourishing largely stems from humanistic theories in which persons are seen as a whole. Persons are encouraged to consciously understand and become their real selves without any direct influence from other persons. For example, Carl Rogers and Abraham Maslow speak of self-actualization or leading a fulfilling life wherein people use their innate capabilities to optimize personal growth (Gray, 2003). Maslow believed that the need for self-actualization can be pursued when basic needs are fulfilled. These basic needs are in ascending order: physiological needs (food, water, homeostasis), safety needs (protection from possible dangers by having a house, parents, social environment etcetera), attachment needs (love, belongingness, intimacy) and esteem needs (competence, self-respect, self-esteem and esteem of others). These needs are often depicted in a hierarchical pyramid with the need for self-actualization on top, although Maslow himself merely mentioned the hierarchical structure which is not completely fixed for every person (Maslow, 1943). Furthermore, Maslow (1943) mentioned “the desire to know and to understand” which can be seen as a cognitive need for searching meaning in life but it has not been explicitly included in Maslow’s hierarchy of needs.

Another human needs theory was developed by Edward Deci and Richard Ryan (2000). They introduced the Self-Determination Theory (SDT) of human behavior according to which innate psychological needs are necessary for intrinsic motivational behavior, personal growth and optimal mental health. The three basic psychological needs according to SDT are the needs for autonomy, competence and relatedness. The need for autonomy consists of the feeling that you can make your own (behavioral) choices and the feeling of independency. The need for competence refers to feelings of effectively engaging in behaviors in order to fulfill desired outcomes. The need for

relatedness is seen as the most fundamental need and refers to feelings of belongingness and strong connections to others. A major advantage of this theory over its humanistic ancestors is that it yielded an abundant amount of empirical studies, which have provided support for the importance of the three basic needs for the motivation to engage in a wide variety of health-related behaviors (e.g. Ng et al., 2012; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000).

Positive mental health framework

The positive mental health framework of Corey Keyes (2002; 2007) integrates the hedonic and eudaimonic well-being perspectives by measuring emotional well-being (hedonia), psychological well-being (eudaimonia) and social well-being (eudaimonia). Table 1 shows an overview of the items of the Mental Health Continuum-Short Form (MHC-SF), an instrument developed by Keyes to assess positive mental health and the main instrument used in this thesis. Three items (1-3) encompass emotional well-being which resembles the definition of subjective well-being (Diener, 1984): happiness, positive affect and life-satisfaction. Six items (9-14) are derived from Ryff's Scales of Psychological Well-Being (SPWB). Carol Ryff (1989) extensively reviewed psychological theories, including the humanistic theories described above, and identified six key dimensions of psychological well-being: self-acceptance, environmental mastery, positive relations with others, personal growth, autonomy and purpose in life. Different versions of the SPWB exist wherein each dimension is measured with 20-, 14-, 9- and 3-items (van Dierendonck, 2004). In the MHC-SF, each dimension is represented by one item. The SDT is partly integrated in the positive mental health framework because autonomy, competence and relatedness are somewhat represented in the items about autonomy, environmental mastery and positive relations with others, although environmental mastery is not directly comparable with competence (Hone, Jarden, Schofield, & Duncan, 2014). A similar approach was undertaken for operationalizing social well-being, derived from a variety of social psychological theories (Keyes, 1998). The remaining five items (4-8) of the MHC-SF each represent one dimension of social well-being: social contribution, social integration, social actualization, social acceptance and social coherence.

Table 1. Overview of the items (symptoms) of the Mental Health Continuum-Short Form

Mental well-being	In the past month, how often did you feel...
Hedonic well-being perspective	
<i>Emotional well-being</i>	
Happiness	1. happy?
Interest (positive affect)	2. interested in life?
Life satisfaction	3. satisfied?
Eudaimonic well-being perspective	
<i>Social well-being</i>	
Social contribution	4. that you had something important to contribute to society?
Social integration	5. that you belonged to a community (like a social group, your neighborhood, your city)?
Social actualization	6. that our society is becoming a better place for people?
Social acceptance	7. that people are basically good?
Social coherence	8. that the way our society works makes sense to you?
<i>Psychological well-being</i>	
Self-acceptance	9. that you liked most parts of you personality?
Environmental mastery	10. good at managing the responsibilities of your daily life?
Positive relations	11. that you had warm and trusting relationships with others?
Personal growth	12. that you have experiences that challenge you to grow and become a better person?
Autonomy	13. confident to think or express your own ideas?
Purpose in life	14. that your life has a sense of direction or meaning to it?

Note. Items derived from Keyes et al., 2008; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011.

Keyes developed his framework analogous to the classification system of diagnosing major depression. This means that each item (dimension) of the MHC-SF can be seen as a symptom of mental health and that people can be “diagnosed” as having flourishing mental health when they possess a certain amount of symptoms. More specifically, according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* (APA, 2000), a major depressive episode requires at least one out of two symptoms of anhedonia and at least four out of seven symptoms of malfunctioning. In parallel, Keyes postulates flourishing mental health as having upper tertile scores (scores of 4 or 5 on a scale from 0-5) on at least one out of three symptoms of hedonia and six out of eleven symptoms of positive functioning (eudaimonia) (Keyes, 2002; Keyes et al., 2008). Keyes also classifies persons with languishing mental health: people with lower tertile scores (scores of 0 or 1 on a scale from 0-5) on at least one hedonic item and at least 6 eudaimonic items. People who can neither be classified as flourishing nor languishing are labelled the “moderately mentally healthy” (Keyes, 2002; Keyes et al., 2008).

PERMA framework

The scientific study of flourishing seems to have received burgeoning attention since the book entitled *“Flourish. A new understanding of happiness and well-being”* of Martin Seligman was released in 2011. Seligman is the founder of positive psychology and describes in his book:

“I used to think that the topic of positive psychology was happiness, that the gold standard of measuring happiness was life satisfaction, and that the goal of positive psychology was to increase life satisfaction. I now think that the topic of positive psychology is well-being, that the gold standard of measuring well-being is flourishing, and that the goal of positive psychology is to increase flourishing” (p. 13).

Seligman (2011) also formulated a long-term mission for positive psychology: *“By the year 2051, 51% of the people of the world will be flourishing” (p. 240).* To accomplish such a goal, scientist, practitioners and policymakers should know where to focus on. According to Seligman (2011), the key for a flourishing life can be found in promoting PERMA. PERMA is an acronym for positive emotion, engagement, (positive) relationships, meaning and accomplishment (Seligman, 2011). Like the positive mental health framework, both the hedonic and eudaimonic perspectives are integrated and positive emotion (hedonia) is valued as a cornerstone of mental well-being.

Taken together, the scientific study about flourishing is still in its infancy and there is no conclusive operationalization of its core-elements. In fact, positive relations is the only aspect that is included in all three models. The studies described in this thesis have been primarily built upon Keyes (2002; 2007) positive mental health framework because this seems to be the most comprehensive, theoretically well founded, framework which has been widely used in empirical research in the field of positive psychology. Furthermore, this framework seems most compatible with the definition of the World Health Organization about mental health (*WHO, 2004, p. 10*) which embodies emotional well-being (subjective state of well-being, which is not included in the SDT), social well-being (functioning in society, which is neither included in the SDT nor the PERMA framework) and psychological well-being (functioning individually):

“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”

Given the current immaturity of the research field about flourishing mental health, which research aims are most pressing in a country like The Netherlands? Epidemiological research might focus on why is flourishing so important, how many people are flourishing in The Netherlands and how can these flourishers be characterized? Intervention research might focus on how flourishing can be cost-effectively enhanced, which well-being processes might act as mechanisms of change, who search for a flourishing life and who might benefit most of a positive psychology-based intervention? These topics will now be briefly discussed and extensively addressed in the upcoming chapters to provide more insight in these “why”, “how” and “for whom” questions about flourishing which could be helpful for further implementation of effective well-being interventions in public mental health and clinical practice.

Why is flourishing important?

When researchers ask people what they want to achieve in life, most people answer that they want to stay healthy and be happy (King & Broyles, 1997). National policy of industrialized nations has been successful in the healthy-part of people's life goals, especially when it comes to physical health problems. People now live longer and they also live more years in good health. However, national policies must still prove successful in addressing mental health problems. For example, the burden of disease attributable to 20 mental disorders and substance use disorders have increased by almost 38% between 1990 and 2010 (Whiteford et al., 2013). Of these mental disorders, mood disorders and anxiety disorders are associated with the largest worldwide proportion of disease burden of 40.5% and 14.6% respectively (Whiteford et al., 2013). In The Netherlands, the highest overall burden of disease in 2011 was caused by mental disorders, followed by cardiovascular disease and cancer (RIVM, 2014). The same study also revealed that anxiety disorders contributed to the largest decrease in quality of life, while mood disorders were on the 4th place in this ranking (RIVM, 2014). Scientists have emphasized the importance of preventing mental disorders as well as promoting mental well-being to keep people in good mental health shape (Forsman et al., 2015; Insel & Scolnick, 2006; Kobau et al., 2011). Whereas addressing lifestyle behaviors might have been successful in improving physical health, an innovative strategy to improve mental health might be to address flourishing mental health.

Recent longitudinal evidence has shown that higher levels of subjective and psychological well-being relates to lower levels of depressive symptomatology (Grant, Guille, & Sen, 2013; Lamers, Westerhof, Glas, & Bohlmeijer, 2015; Wood & Joseph, 2010) and reduces suicide risk (Koivumaa-Honkanen, Kaprio, Honkanen, Viinamaki, & Koskenvuo, 2004). There is also compelling evidence that higher levels of hedonic well-being (e.g. life-satisfaction, energy, joy) and eudaimonic well-being (e.g. optimism, hopefulness, vitality) increases longevity, in healthy populations and some somatic illness populations (Chida & Steptoe, 2008; Diener & Chan, 2011). Importantly, longitudinal studies have also demonstrated that flourishing mental health was most strongly related to reduced risk of anxiety and depressive disorders and mortality opposed to having moderate mental health or languishing mental health (Keyes et al., 2012; Keyes & Simoes, 2012; Keyes, Dhingra, & Simoes, 2010). Cross-sectional studies towards flourishing mental health have demonstrated that the state of flourishing is related to fewer mental health symptoms (Keyes, 2007; Peter, Roberts, & Dengate, 2011), better work performance (Hone, Jarden, Duncan, & Schofield, 2015; Keyes & Grzywacz, 2005), fewer physical complaints (Hone et al., 2015; Keyes, 2007), lower health care costs

(Keyes & Grzywacz, 2005) and student engagement (Fink, 2014; Low, 2011). However, the scant evidence of the benefits of flourishing mental health largely stems from studies of Keyes and of data from people living in the USA.

Hence, policymakers worldwide should promote mental well-being in the general population and use measures of emotional, social and psychological well-being to monitor how well people live. However, most nations merely use economic indicators to value the wealth of nations, such as Gross Domestic Product (GDP). Such indicators are not synonymous for the well-being of nations (Diener & Seligman, 2004). Diener and Seligman (2004) demonstrated that the GDP of the USA had steadily increased in the 50 years after the World War II, while life-satisfaction had barely changed at all. Contrary to what people often expect, money does not buy happiness, at least not in most industrialized nations (Diener & Biswas-Diener, 2002; Diener & Seligman, 2004). In these nations, there is an abundant amount of choice and availability of materialistic goods and luxury services, but this wealth can also evoke more distress and social problems (Diener & Seligman, 2004). Consequently, economic indicators might not be the only indicators for decision-making purposes in government policy, and subsequently, in municipal and health-care policy. Rather, national policies of industrialized nations should stimulate the measurement of hedonic and eudaimonic well-being indicators as well.

More recently, socio-economic research fueling policy includes measures of mental well-being, but merely surveys hedonic well-being with single-items or brief measures about happiness or life-satisfaction (Diener & Biswas-Diener, 2002; Diener & Seligman, 2004). For example, in 2012, the first World Happiness Report was published using data from the Gallup World Poll. This report shows the survey-results and international rankings of emotional well-being measures of 156 countries. Analyses were repeated in 2013 and 2015, also showing national changes in happiness between those years, indicating that subjective well-being has turned out to be quite high and stable within industrialized nations, leaving not much room for improvement (Helliwell, Layard, & Sachs, 2016). A next step might be to also include eudaimonic well-being indicators as has now sporadically been done (Huppert & So, 2013; Keyes, 2005, 2006). The positive mental health framework of Keyes (2002; 2007) has shown initial evidence for the importance of measuring and enhancing flourishing mental health which will be further supported by a study described in Part I of this thesis. Furthermore, it is yet unknown if the state of flourishing can be influenced. How can mental well-being be effectively improved so people can flourish? And who will be likely users of a well-being

enhancing intervention? These will be main questions of Part II of this thesis, which will now be briefly discussed.

How to enhance flourishing in everyday life?

The positive psychology movement has led to a rich literature about positive psychology interventions to enhance mental well-being aspects. To date, two meta-analyses have been conducted which I will briefly discuss. The first meta-analysis was performed by Sin and Lyubomirsky (2009) and included 49 studies ($n = 4235$) aimed at improving mental well-being and 25 studies ($n = 1812$) aimed at decreasing depressive symptoms. A broad inclusion criterion for this review was used, namely: studies about *“an intervention, therapy, or activity primarily aimed at increasing positive feelings, positive behaviors, or positive cognitions, as opposed to ameliorating pathology or fixing negative thoughts or maladaptive behavior patterns”*. Results demonstrated that these interventions significantly improved mental well-being ($r = .29$) and reduced depressive symptoms ($r = .31$), both indicating medium effect sizes (Sin & Lyubomirsky, 2009). A few factors emerged as moderators of the effects, showing more beneficial effects of positive psychology interventions for: (1) samples of people with a depression status rather than no depression status, (2) self-selected samples, (3) older adult samples, (4) individual therapy as compared to group therapy or self-help interventions, (5) longer duration of interventions and (6) no-treatment control groups compared to other types of control condition (Sin & Lyubomirsky, 2009).

The second meta-analysis was conducted three years later and refined the inclusion criterion by adding *“The intervention should have been explicitly developed in line with the theoretical tradition of positive psychology”* to the above mentioned criterion of Sin and Lyubomirsky and included RCTs only (Bolier et al., 2013). This meta-analysis included 28 studies ($n = 2714$) assessing subjective well-being as outcome, 20 studies ($n = 3488$) assessing psychological well-being as outcome and 14 studies ($n = 3195$) assessing depressive symptoms as outcome. Effect sizes were considerably lower than the prior meta-analysis, with $d = .34$ for subjective well-being ($\approx r = 0.17$), $d = .20$ ($\approx r = 0.10$) for psychological well-being and $d = .23$ ($\approx r = 0.11$) for depressive symptoms. The difference in effects might have been attributed to the more stringent criteria used in the study of Bolier and colleagues (2013) who included more high-quality studies than Sin and Lyubomirsky (2009). Furthermore, Bolier and colleagues (2013) found only some moderators of the effects of positive psychology interventions on depressive symptoms. Most beneficial effects were found for a (1) longer duration of the intervention, (2)

individual therapy over group therapy and self-help interventions, (3) recruitment via clinical practitioners or hospitals rather than other recruitment strategies, (4) people with psychosocial problems versus no problems and (5) low quality studies versus high quality studies.

Taken together, positive psychology interventions seem most effective for distressed people and might be most effective when offered as individual therapy during several weeks. However, most interventions in both meta-analyses were targeting only one or two key-components of positive psychology (with one or more exercises), such as positive emotions, optimism or use of strengths. Larger effects might be expected from multicomponent intervention. The most comprehensive programs for clinical practice are Positive Psychotherapy (Rashid, 2014; Seligman, Rashid, & Parks, 2006) and Well-being therapy (Fava, 1999; Ruini, Albieri, & Vescovelli, 2014), which were also included in both meta-analyses. However, these individual or group therapy programs require skilled (and expensive) therapists limiting the reach of people in need. A more cost-effective alternative to face-to-face counseling, also better fitting a public mental health perspective, is guided self-help. Self-help interventions might be guided by therapists, counselors or coaches and can be offered to individuals and groups, and via synchronous (e.g. chat) or asynchronous (e.g. email) communication (Barak, Klein, & Proudfoot, 2009). Although online positive psychology self-help interventions are emerging, not all people prefer such interventions. Another self-help alternative attracting many people is bibliotherapy which can also be offered in combination with online counseling.

Bibliotherapy

Bibliotherapy is the use of a self-help book for therapeutic reasons such as to alleviate depressive mood. Bibliotherapy has been shown effective in the treatment of depression (Gregory, Schwer Canning, Lee, & Wise, 2004), but there is a gap in the literature about the efficacy of bibliotherapy to improve mental well-being. The number of books for “more happiness in life” is growing albeit only one prior study investigated a multicomponent self-help book primarily aimed at improving mental well-being (Parks & Szanto, 2013). These researchers investigated the efficacy of the book “The how of happiness” of Lyubomirsky (2007). Participants in the RCT study received four chapters of this self-help book about optimism, positive relations, resilience and mindfulness. This intervention condition was compared with a condition wherein participants received the widely used and effective book “Control your depression” (Anderson et al., 2005; Clarke & Lewinsohn, 1989; Cuijpers, 1997; Gregory et al., 2004) and a neutral control condition

in a sample of 58 students (Parks & Szanto, 2013). Results showed beneficial effects of both self-help books on life-satisfaction at 3 and 6 months and on depressive symptoms at 3 months compared to the control condition. Importantly, participants highly preferred the well-being intervention over and above the cognitive-based intervention (Parks & Szanto, 2013), suggesting that the reach of people for preventing mental disorders might be enriched by including multicomponent well-being interventions in public mental health and clinical practice.

In Part II of this thesis, I will describe a new multicomponent bibliotherapy intervention to improve mental well-being called “This is your life”, which was offered with email support to increase adherence. Although the personal counselors were instructed to use some therapeutic techniques like positive reinforcement for signs of awareness or for positive behavior change, the intervention can be characterized as a guided self-help intervention rather than individual therapy. While the meta-analyses showed larger effects for the latter, prior studies regarding self-help for anxiety and depression has shown larger effects for guided versions of self-help interventions than for their unguided counterparts (Cuijpers, Donker, van Straten, Li, & Andersson, 2010). However, it remains largely unknown whether email guided self-help interventions—and positive psychology interventions in general—are cost-effective interventions to enhance flourishing mental health. This seems essential to know for widely implementation of the intervention and a health-economic evaluation will be addressed in this thesis. Furthermore, it is largely unknown who might search for an email guided self-help intervention to improve mental well-being and who could benefit most of it.

Who is searching for a flourishing life?

It could be argued that all human beings should strive a flourishing mental health status on most days of their lives, but not all human beings want—and should—participate in therapeutic interventions to achieve that. So, what groups of people are likely target populations for researchers, clinicians and policy makers? Although many positive psychology studies have been conducted in student samples, this is obviously not the entire target population relevant for public mental health and clinical practice. Parks and colleagues (2012) were the first to identify subgroups of people who are searching for an online program to increase their happiness. Their analysis yielded two large subgroups: one half of the participants showed severe depressive symptoms and below average life-satisfaction scores, and the other half of the participants showed average depression symptoms and average life-satisfaction scores (Parks et al., 2012). In terms of Keyes’

positive mental health framework (2002; 2007): the former group is probably not flourishing (probably classified as languishing mental health) and has (almost) a clinical depression, while the latter group is not flourishing (probably classified as having moderate mental health) but has no clinical depression either. In the current thesis, I will focus on the latter group of people who were recruited in the general population.

The theory of planned behavior assumes that behavior change can largely be explained by behavioral intentions or the desire to change (Ajzen, 1991). A recent study showed that stronger intentions to change behavior were significantly explained by higher levels of curiosity and lower levels of depression in students who engaged in a web-based gratitude exercise (Kaczmarek et al., 2013). However, to convert intentions into behavior might require a large amount of treatment motivation. Drieschner and colleagues (2004) argued that there are six internal determinants of treatment motivation: problem recognition, level of suffering, external pressure, perceived costs of treatment, perceived suitability of treatment and outcome expectancy. Together with more uncontrollable external determinants such as circumstances, demographic factors and the kind of problem, the internal determinants might explain the motivation to engage in treatment which is the road to actual treatment engagement (Drieschner et al., 2004). So, while our intended study population was not flourishing and also not suffering from clinical anxiety or depressive symptoms, what is their level of suffering? In other words, what are their motives to engage in treatment and are certain motives related to better treatment outcomes?

In anticipation of what is described in Part II of this thesis, I will now illustrate a few personal stories of people who participated in my randomized controlled trial (RCT) who had the intention to “search for more well-being and resilience in their lives”—in other words a flourishing life—as was the recruitment message used in the RCT. These examples stem from introduction emails sent from participants to their personal counselor and gives an idea of our target population as well as future target populations for implementation of the intervention. These personal stories show that people who are not flourishing experience real or even severe problems in everyday life, although they did not fulfill criteria of moderate to severe clinical symptomatology.

Female, 47 years, divorced, 2 children.

[...] I work 21,5 hours per week on average (26 hours when the children are with their father, 17 when they are with me). The home-situation between 2010 and 2011 was tough because of a combination of a cheating husband, children at college or exams and children who were growing-up. This affected my job reviews. [...] Since 2013 I started fitness again after years of no sports. I like this, but it is sometimes hard to find the time in the current situation. [...] I have a good health, although my blood pressure is often too high for which I take medicine for. I also have a history of migraine. [...] During my marriage there have been various stressful events:

- The husband of my sister died young, leaving his wife and little baby*
- Youngest brother of my ex-husband died young in an accident*
- House burned down*
- [Mentions several severe accidents of her ex-husband]*
- [Mentions tough and worrying pregnancies / births]*

I am positive in life and try to keep my humor, but sometimes it is just too much. If you compare me with a rubber band, it seems as though the stretch is gone.

Male, 49 years, divorced.

[...] The reason I am participating is difficult: I was triggered by an advert in the paper and then checked the website. I notice that I have difficulty with meaning, goal-setting and making choices; and that makes me upset now and then. [...] When I feel depressed, I focus even more on the negative and my deficiencies [...]. I would like to try to reduce these moments to last less long in number and duration (thus, more resilience) by participating in this study. And I would like to discover what really makes me happy and to focus on the things that are good (which?). This keeps me busy for a long time now but I find it difficult to find an answer to this.

So I would like to use [this course] to give meaning and purpose to the second part of my working life.

Female, 29 years, living with partner.

[...] The reason I participate in this course is that I have a busy and hectic life. Many social contacts, a full-time job which I like but also asks for long work days, stressful moments and high feelings of responsibility. Because of this, I noticed that I cannot always let go of my job and I can sometimes feel stressed during the night. I hope this course will give me some insights to deal with this more easily.

In sum, flourishing mental health is defined as having high levels of emotional well-being (hedonia) and social- and psychological well-being (eudaimonia). A new strategy for reducing the burden of disease attributable to mood and anxiety disorders might be to enhance flourishing in the general population. While both depressed and non-depressed people might search for a happy life, this thesis will focus on people who are not flourishing and also have no clinical depression. Though, they may have mild anxiety or depressive symptomatology and seem to experience real problems in everyday life. In this group, a multicomponent well-being intervention seems needed to increase mental well-being up to a flourishing mental health status. In this thesis, the efficacy of a guided self-help intervention (bibliotherapy) is investigated. I will now end this chapter by providing the reader an overview of the chapters of this thesis.

Outline of this thesis

The main goals of this thesis are addressed in the two main parts of this thesis:

- The purpose of **Part I** is: What characterizes people with flourishing mental health in the general population in The Netherlands? In this part, data of a representative longitudinal study in The Netherlands will be used: the Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2).
- The purpose of **Part II** is: Can flourishing be effectively enhanced through the use of a multicomponent well-being intervention? In this part, data of a randomized controlled trial (RCT) will be used, for which participants were recruited in the general population of The Netherlands.

Part I

Chapter 2 shows the prevalence of flourishing mental health in The Netherlands in 2012 and describes how demographics, personality traits and situational factors are associated with a flourishing mental health status. **Chapter 3** examined the longitudinal relationship between flourishing mental health on time 1 and a diagnosed DSM-IV disorder on time 2, which is three years later. In other words, is a flourishing mental health status protective for the onset of mental disorders later in life?

Part II

Chapter 4 describes the study protocol of the RCT about an email guided multicomponent positive psychology intervention, of which the data are used in the remaining chapters. **Chapter 5** discusses a validation study of a potential new scale to measure flourishing, “The Flourishing Scale”. The internal and external validity is examined by using the baseline data of the RCT. For the first time, Rasch analysis was used to show the measurement precision of this scale. **Chapter 6** shows the main results of the RCT on mental well-being, flourishing, anxiety and depression. Moderation analyses were also conducted to reveal if subgroups of participants had benefited most from participating in the intervention. **Chapter 7** examined whether the email guided intervention was cost-effective from a health-care perspective. In **Chapter 8**, results on six process measures (positive emotions, use of strengths, optimism, self-compassion, resilience and positive relations) were presented and single and multiple mediation models were performed to examine whether all of these processes had contributed to the main results of the intervention (i.e. on mental well-being, anxiety and depression). Finally, **Chapter 9** shows the results of a mixed method study: a qualitative content analysis of the email correspondence between participants and their counselors combined with a quantitative analysis of participants’ outcome measures. This chapter closes this thesis by showing who participated in the intervention and for whom the intervention seems most successful.

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Chapter 2

What Factors are Associated with Flourishing? Results from a Large Representative National Sample

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Abstract

Flourishing is the ultimate end-state in psychology and a key-concept in the field of positive psychology research. Flourishers are those individuals with both high levels of hedonic well-being and eudaimonic well-being. Although many researchers have focused on one or another of these domains, only a few have investigated the comprehensive state of flourishing. The purpose of this study was to examine the prevalence of flourishing and its association with socio-demographics, personality traits and situational factors. This study used data from the second wave of the Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2), a national representative sample of adults in The Netherlands ($n = 5303$; 2010–2012). Findings were compared to having either high hedonic well-being or high eudaimonic well-being. Results showed that 37% of the respondents were flourishers, mainly characterized by high levels of conscientiousness and extraversion and low levels of neuroticism. The situational factors of social support and positive life-events were significantly associated with flourishing when the analysis was controlled for socio-demographics and personality traits. Flourishing was most distinct from high hedonic well-being and showed parallelism with high eudaimonic well-being. More research is needed to establish a preferred flourishing instrument with validated cutoff points for flourishing and to understand the processes of situational factors that may underlie the promotion of flourishing. We recommend longitudinal designs and experience sampling studies to investigate the unique and modifiable predictors of flourishing. In addition, future research should include intervention studies that examine through which hedonic and eudaimonic pathways flourishing can be achieved.

Introduction

Researchers have become increasingly interested in the concept of flourishing (Diener et al., 2009; Henderson, Knight, & Richardson, 2013; Huppert & So, 2013; Keyes, 2002; Seligman, 2011). Flourishing is defined as having high levels of both hedonic well-being and eudaimonic well-being (Huppert, 2009; Huppert & So, 2013; Keyes, 2002) although different operationalizations of flourishing circulate in the literature (see Hone, Jarden, Schofield, & Duncan, 2014). Hedonic well-being comprises subjective or emotional well-being which, in turn, consists of the components happiness, life-satisfaction and a positive-negative affect balance (Diener, 1984). Psychological well-being and social well-being are part of eudaimonic well-being and include a wide variety of components such as meaning, engagement, purpose in life, positive relations and personal growth (Keyes, 2002; Ryan, Huta, & Deci, 2006; Ryff, 1989). Flourishers seem to have excellent mental and physical health and are more resilient to vulnerabilities and challenges in life than non-flourishers (Bergsma, Veenhoven, ten Have, & de Graaf, 2010; Diener & Seligman, 2002; Huppert, 2009; Kobau et al., 2011; Lyubomirsky, Sheldon, & Schkade, 2005b; Ryff & Singer, 1998; Ryff & Singer, 2008; Veenhoven, 2007).

A few studies combined a measure of hedonic well-being with a measure of eudaimonic well-being to compare four groups of individuals: those with high hedonic and high eudaimonic well-being, those with high hedonic well-being and low eudaimonic well-being, those with low hedonic well-being and high eudaimonic well-being, and those with low hedonic and low eudaimonic well-being (Huta & Ryan, 2009; Keyes, 2002; Peterson, Park, & Seligman, 2005). Each study used different assessments of well-being and, consequently, different categorization methods to identify each group. For example, Huta & Ryan (2009) assessed the intention of undergraduates to participate in hedonic activities (i.e. “seeking pleasure” or “seeking relaxation”) and eudaimonic activities (i.e. “seeking to pursue excellence or a personal ideal” or “seeking to use the best in yourself”) with the median on these intentions to allocate high or low well-being. Results showed that individuals with both high hedonic and high eudaimonic motives—as compared to individuals in the other three groups—had the most favorable outcomes on vitality, awe, inspiration, transcendence, positive affect and meaning. Some of these outcomes were more strongly related to hedonic activities, while others were more strongly related to eudaimonic activities, suggesting that both hedonic and eudaimonic activities should be pursued for the most optimal and diverse well-being (Huta & Ryan, 2009). These conclusions were in line with a previous study examining pleasure, engagement and meaning as the three orientations to happiness (Peterson et al., 2005). A major strength of this inquiry was that the authors found the same beneficial results for

various applied categorization methods (Peterson et al., 2005). A different type of study computed the tertiles on a subjective well-being scale and a psychological well-being scale to allocate participants to one of the four groups and found different patterns for each group in relation to socio-demographics and personality traits (Keyes, 2002). For example, flourishers were older and better educated than languishers, while age was highest in the predominantly hedonic group and education was highest in the predominantly eudaimonic group (Keyes, 2002). Taken together, high levels of both hedonic and eudaimonic well-being often lead to the most favorable outcomes compared to high levels on one well-being domain combined with low levels on the other well-being domain (Huta & Ryan, 2009; Keyes, 2002; Peterson et al., 2005).

Despite the central focus of flourishing in positive psychology research (Huppert, 2009; Rose, 2008; Seligman, 2011), only a few studies have investigated the prevalence of flourishing in the general population and the characteristics of flourishers. In this paper, we examine the prevalent rate of flourishing, defined as having high levels of both hedonic and eudaimonic well-being, in a national representative sample of adults in The Netherlands. We also examine how various characteristics are associated with flourishing, including socio-demographics, personality traits and the situational factors social support, life-events and physical health status. This study builds upon former research in that we compare flourishers to those individuals with only high hedonic well-being (i.e. not in combination with low eudaimonic well-being) or only high eudaimonic well-being (i.e. not in combination with low hedonic well-being). Also, to the best of our knowledge, this is the first study to examine the relationship between the above mentioned situational factors and flourishing.

Prevalence of flourishing

Available epidemiological studies of flourishing used different study populations and operationalizations of flourishing, which makes it difficult to compare the results. One of the largest studies on flourishing was conducted by Huppert and So (2013), who used a representative sample of 43,000 respondents in 22 European countries. They developed a conceptual framework and identified ten dimensions of flourishing clustered around three factors. An individual is “flourishing” when Factor 1 (i.e. positive emotion) is present, in combination with at least four out of five Factor 2 dimensions (i.e. emotional stability, vitality, optimism, resilience, self-esteem) and at least three out of four Factor 3 dimensions (i.e. engagement, competence, meaning and positive relationships). The study of Huppert and So (2013) revealed major differences in the prevalence of

flourishing between Northern, Eastern, and Southern/Western European countries. For instance, Denmark led the ranking with 40.6% of flourishers, followed by Switzerland (30.2%), and at the bottom-end were Slovakia, Russia and Portugal with respectively 9.9%, 9.4% and 9.3% flourishers (Huppert & So, 2013). These differences between groups of countries correspond to the happiness data of countries previously collected in the World Database of Happiness (Veenhoven, 2010).

Keyes (2002; 2005) has provided a comprehensive approach for conceptualizing and studying flourishing. Following Keyes' definition, flourishers are those individuals with high levels of emotional, social and psychological well-being. The first dimension can be seen as part of the hedonic domain, and the latter two dimensions as part of the eudaimonic domain. According to Keyes (2002), the opposite of flourishing is languishing, and those individuals who are neither flourishing nor languishing are defined as having moderate mental health. A national representative study of adults in the US assessed each well-being dimension with a different questionnaire and demonstrated that there were 18% flourishers and 17% languishers (Keyes, 2002). This study set the stage for the development of the Mental Health Continuum-Short Form (MHC-SF), an instrument for assessing well-being and flourishing. A first evaluation of this 14-item questionnaire in a South African adult sample revealed a prevalence of 20% for flourishing and 12% for languishing (Keyes et al., 2008). The MHC-SF is now widely used in well-being research, but less is known about the prevalence of flourishing in national representative studies using this instrument.

Characteristics of flourishers

The research into the characteristics of flourishers to date has tended to focus on hedonic or eudaimonic well-being. Moreover, only a few studies have been published about predictors of flourishing. In addition, the evidence for flourishing has hitherto been based on a narrow empirical sample because the currently available studies on factors related to flourishing all relied on a single database, the Midlife in the United States (MIDUS) study (Keyes, 2002; Keyes, 2005, 2007; Keyes & Simoes, 2012; Keyes, Shmotkin, & Ryff, 2002). Consequently, in order to expand the existing knowledge, we built a more comprehensive frame of reference for our study into flourishing by incorporating studies that had explored emotional, psychological and social well-being.

A substantial body of research suggests that socio-demographics, such as female gender, higher national and personal income, higher education, living with a partner and paid employment are positively related to subjective well-being (Diener, Diener, & Diener, 1995; Diener & Ryan, 2009; Diener, Suh, Lucas, & Smith, 1999; Veenhoven, 1996; Veenhoven, 2007) and to psychological well-being (Ryff & Keyes, 1995; Ryff & Singer, 2008). Higher educational attainment, higher household income and higher employment status also show strong relationships with social well-being (Cicognani et al., 2007; Keyes & Shapiro, 2004; Keyes, 1998). Studies about flourishing demonstrated that males, adults between 45 and 54 years, adults with 16 or more years of education and married adults were most likely to flourish (Keyes, 2002; Keyes & Simoes, 2012; Keyes et al., 2002). Socio-demographics often added least to the explained variance in well-being outcomes when other variables were taken into account (Demir & Weitekamp, 2006; Keyes et al., 2002; Lamers, Westerhof, Kovács, & Bohlmeijer, 2012b).

Of all studied predictors, personality traits seem to have the strongest relationship with subjective and psychological well-being, especially low neuroticism, high extraversion and high conscientiousness (DeNeve & Cooper, 1998; Keyes et al., 2002; Lamers et al., 2012b; Steel, Schmidt, & Shultz, 2008). The theory of chronic happiness (Lyubomirsky et al., 2005b) states that there is a stable genetic happiness set point that is unlikely to change. This genetic set point has been estimated to contribute 50% to long-term happiness. In line with this theory, different studies found that personality traits are strongly correlated with well-being and often explain most of the variance in well-being outcomes when taking other variables into account (Demir & Weitekamp, 2006; Keyes et al., 2002; Lamers et al., 2012b; Steel et al., 2008). A twin study even suggested that the underlying genetic structure for subjective well-being is the same as for individual differences in personality traits (Weiss, Bates, & Luciano, 2008). High levels of extraversion and conscientiousness and low levels of neuroticism have also been found to relate to the state of flourishing (Keyes et al., 2002).

Socio-demographics and personality traits are well-studied in relation to well-being, but less is known about situational factors such as social support, life-events and physical health status. Studies have demonstrated that having more social support and social participation relate to higher subjective and psychological well-being (Diener & Seligman, 2002; Diener & Seligman, 2004; Huppert, 2009; Keyes, 1998), long-term happiness (Caunt, Franklin, Brodaty, & Brodaty, 2012), and resilience, vitality and mental health (Barry, 2009; Lehtinen, Sohlman, & Kovess-Masfety, 2005). The relationship between subjective well-being and positive and negative life-events is yet

unclear. Not all life-events can be objectively rated as positive or negative when it comes to well-being outcomes. For example, getting married could be objectively rated as a positive life-event, but its effects varied from initially a higher level of life-satisfaction to lower subjective well-being in the long-term (Luhmann, Hofmann, Eid, & Lucas, 2012). Divorce, on the other hand, could be objectively rated as a negative life-event, but, in fact, led to a small increase in subjective well-being in the short and long-term (Luhmann et al., 2012). The hedonic treadmill theory claims that every life-event that provokes positive or negative emotional reactions has a short-term effect on the level of subjective well-being before it returns to its baseline state. However, new empirical evidence suggests that there are individual differences in the level and number of baseline states and that some baseline states can change (Diener, Lucas, & Scollon, 2006; Lucas, 2007). Finally, subjective and psychological well-being have a positive relationship with physical health outcomes such as lower physical impairment in daily activities (Keyes, 2002; Keyes, 2005), less physical diseases and conditions (Keyes, 2007), faster recovery of physical illness, and longevity (Lamers, Bolier, Westerhof, Smit, & Bohlmeijer, 2012a; Lyubomirsky, King, & Diener, 2005a). Yet, it is unknown to what extent these situational factors are associated with flourishing. A recent study by Keyes and Simoes (2012) found no significant differences in common physical diseases between flourishers and non-flourishers.

To summarize, the science of flourishing is still in its infancy. Therefore, the purpose of the present study was to contribute to the science of flourishing by estimating the prevalence of flourishing in a representative adult population sample in The Netherlands and to examine what factors were associated with flourishing. We expected a stronger relationship between flourishing and the personality traits of extraversion, neuroticism and—to a lesser degree—conscientiousness, than with socio-demographics and situational factors. To address the lack of consistent evidence regarding the relationship between flourishing and different situational factors, we explored whether social support, life-events and physical health status were associated with flourishing, over and above socio-demographics and personality traits, without any specific hypotheses. Finally, we explored differences and similarities in prevalence and associated characteristics between flourishing on the one hand and having high levels of either hedonic well-being or eudaimonic well-being on the other.

Method

Design and sample

We used data from the Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2), which is a nationally representative Dutch population study designed to examine the mental health status of non-institutionalized persons aged 18–64 years in The Netherlands (de Graaf, ten Have, & van Dorsselaer, 2010). NEMESIS-2 is a three-wave longitudinal study with a 3 year interval. We used the cross-sectional results of 5303 respondents who participated in the second wave of NEMESIS-2 because, in this wave, the MHC-SF was included to measure well-being and flourishing. We also used data on socio-demographics, personality traits and situational factors (i.e. social support, life-events and physical health status) from the first and second wave.

At baseline, participants were recruited from a random sample of 184 of the 443 existing Dutch municipalities between November 2007 and July 2009. In the 184 municipalities, a random sample of private households was drawn from postal registers. The adult with the most recent birthday was selected for participating in a face-to-face interview to complete different questionnaires. If necessary, this adult person with sufficient fluency in the Dutch language was contacted by phone or a home visit at least ten times, and these contacts are described in detail elsewhere (de Graaf, ten Have, Tuithof, & van Dorsselaer, 2013a; de Graaf et al., 2010; de Graaf, ten Have, van Gool, & van Dorsselaer, 2012). The response rate was 65.1% for the first wave ($n = 6646$). The sample was nationally representative, although younger participants were somewhat underrepresented. In the second wave, respondents were re-interviewed three years later between November 2010 and June 2012, with a response rate of 80.4% ($n = 5303$). Attrition was related to younger age, lower educational level, not having a partner, not being in paid employment and not being born in The Netherlands, but not associated with mental disorders and their clinical characteristics after controlling for socio-demographics (de Graaf et al., 2013a; de Graaf, van Dorsselaer, Tuithof, & ten Have, 2013b).

Measurements

Well-Being and flourishing

The Dutch version of the 14-item MHC-SF measures well-being during the past month with one hedonic dimension and two eudaimonic dimensions, each with at least three theoretically based components (i.e. items about feelings) per dimension (Keyes et al.,

2008; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). Emotional well-being (hedonic well-being) consists of the happiness, positive affect and life-satisfaction components (e.g. "In the past month, how often did you feel happy?"). The eudaimonic dimensions are social and psychological well-being. Social well-being consists of the following components: social contribution, social integration, social actualization, social acceptance and social coherence (e.g. "In the past month, how often did you feel that our society is becoming a better place for people?"). Psychological well-being comprises the six components of Ryff (1989): self-acceptance, environmental mastery, positive relations with others, personal growth, autonomy and purpose in life (e.g. "In the past month, how often did you feel confident to think or express your own ideas and opinions?"). Respondents rated every item on a 6-point Likert scale, where 0 = *never*, 5 = (*almost*) *always*. The mean score was computed, and higher scores indicated higher well-being. Hotdeck imputation (Myers, 2011) was used to impute the missing data on one or more items from 339 individuals (6.4%). The MHC-SF has excellent psychometric properties and has been validated in different countries (Keyes et al., 2008; Keyes, Dhingra, & Simoes, 2010) including The Netherlands (Lamers et al., 2011; Lamers et al., 2012b). The internal consistency (Cronbach's alpha) of the total well-being scale was .87, and the internal consistencies of the subscales were .82 for emotional well-being, .66 for social well-being and .79 for psychological well-being.

The continuous measure of well-being can be used to determine the level of positive mental health. However, in this study, we were specifically interested in flourishers: those individuals who scored highest on both hedonic and eudaimonic well-being. We, therefore, used Keyes's criteria (2006; Keyes et al., 2008) to generate well-being categories. Individuals who scored 4 or 5 on one or more items of emotional well-being possessed the highest levels of hedonic well-being (0 = *no*; 1 = *yes*), and individuals who scored 4 or 5 on six of the eleven items of the combined scale of social and psychological well-being possessed the highest levels of eudaimonic well-being (0 = *no*; 1 = *yes*). Flourishers were those individuals with a score of 1 on both well-being domains. Languishers were those individuals who scored 0 or 1 on one or more items of emotional well-being and who scored 0 or 1 on six of the eleven items of the combined scale of social and psychological well-being. The persons who were neither flourishing, nor languishing were labelled as moderately mentally healthy.

Socio-demographics

Socio-demographics included age, gender, educational attainment, living situation, employment situation and urbanization. Educational attainment was measured during the first wave of NEMESIS-2, and all other socio-demographics during the second wave. In the statistical analyses, we treated educational attainment as a continuous variable ranging from 1 (*primary education*) to 4 (*higher professional education, university*) and we transformed living situation into a dummy code (0 = *alone*; 1 = *not alone*) because living alone was the strongest significant indicator versus the other categories.

Personality traits

Two subscales of the Eysenck Personality Questionnaire—Revised Short Scale (EPQ—RSS) were used to measure neuroticism (i.e. emotional instability, worrying, nervousness) and extraversion (i.e. impulsivity, outgoing, lively) (Eysenck, Eysenck, & Barrett, 1985; Eysenck, White, & Eysenck, 1976; Sanderman, Arrindell, Ranchor, Eysenck, & Eysenck, 1995). Both scales consisted of 12 items with ratings of *yes* (1) or *no* (0). For each personality trait, a total score was computed with higher scores indicating higher levels of the trait ranging from 0 to 12. Cronbach's alpha was .80 for neuroticism and .83 for extraversion. These two subscales were measured in the first wave, and, therefore, not measured at the same time as well-being.

Conscientiousness (i.e. organized, responsible, ambitious) was measured on the second wave with one scale of the NEO Five Factor Inventory (NEO-FFI) (Costa & McCrae, 1995). Participants rated the 12 items on a scale ranging from (1) *totally disagree* to (5) *totally agree*. The total score ranged from 12 to 60 with higher scores indicating higher levels of conscientiousness. Cronbach's alpha was .81.

Situational factors

Social support was measured during the second wave with two questions for each of the following resources in the close network: the partner, family and friends, and neighbors. The questions referred to the extent to which respondents could (1) rely on their resources for help if they had a problem and (2) open up to them if they needed to talk about worries. The four response categories ranged from 1 (*not at all*) to 4 (*a lot*). The mean score on both questions was used to indicate the respondent's perceived social support from a resource. Because not everyone had a partner, the total mean score was calculated from either two or three resources for social support (Ten Have, de Graaf, van

Weeghel, & van Dorsselaer, 2014). In the analyses, we only used this total score for the level of social support.

Major negative life-events (9 items) and major positive life-events (6 items) during the past twelve months before the second wave were measured with a scale based on the Brugha Life-events Section (Brugha, Bebbington, Tennant, & Hurry, 1985). Examples of negative life-events were “your child, brother, sister, parent or partner died” or “you were fired or became unemployed”, and examples of positive life-events were “you found a new partner” or “a close family-member or your partner recovered from a serious disease or injury”. Participants could also report other life-events in the open answer category. These answers were checked to make sure that they belonged to one of the life-events categories. Any open answers of a participant that remained were counted as one life-event for each individual because this category contained additional information. The number of life-events in our sample ranged between 0 and 5 for negative life-events, and between 0 and 4 for positive life-events.

Physical health status during the past month was assessed during the second wave by the Dutch version of the RAND 36-item Health Survey 1.0 (RAND-36; van der Zee & Sanderman, 1993). The RAND-36 consists of 36 items encompassing eight dimensions: physical functioning, social functioning, role limitations due to physical problems, role limitations due to emotional problems, mental health, vitality, bodily pain and general health. Response categories differ between items, and every summed subscale was transformed to a scale of 0–100 with higher scores indicating better functioning (Stewart, Hays, & Ware, 1988). Cronbach’s alpha ranged between .76 for general health and .92 for physical functioning. Scores on the eight dimensions were aggregated into the Physical Component Summary (PCS) and Mental Component Summary (MCS). The subscale scores were transformed into z-scores using Dutch means and standard deviations (van der Zee & Sanderman, 1993) and multiplied with the US factor score coefficients to facilitate international comparisons. These coefficients were summed over all eight subscales. To obtain normally distributed transformed summary scores with a *mean* of 50 and an *SD* of 10, the PCS and MCS sums were multiplied by 10 followed by adding 50 (van der Zee & Sanderman, 1993; Ware, Kosinski, & Keller, 1994). In the analyses, we only used the PCS score because this score represented the physical health status of individuals which was the main interest in our current study. The MCS score was already reflected in our primary outcome of well-being and flourishing.

Statistical analyses

We obtained the estimates of the prevalence of flourishing with descriptive statistics. Because there were few languishers in our study (see Results), we created a dummy variable for *flourishers* (1) versus *non-flourishers* (0) for subsequent analyses. We then generated descriptive statistics of the socio-demographics for flourishers and non-flourishers, and we tested the differences with Chi-square statistics and ANOVA. For the categorical variables with more than one category, we generated indicator contrasts that tested for significant differences between flourishers and non-flourishers for each category compared to all other categories ($p < .001$). Bivariate correlations were examined using Pearson's correlation coefficient between flourishing and the independent variables. Then, all significantly associated factors with flourishing were included in a stepwise multiple logistic regression analysis with three steps. The first step included socio-demographics because these were relatively stable characteristics and, in previous studies, have added little to explaining the variance in well-being (Demir & Weitekamp, 2006; Lamers et al., 2012b). In the second step, the personality traits were added because of their expected high level of explained variance in flourishing (Demir & Weitekamp, 2006; Lamers et al., 2012b; Steel et al., 2008). Situational factors were added in the third step in order to explore if these factors were associated with flourishing above and beyond personality traits and socio-demographics. All the statistical analyses mentioned above were repeated with the binary classifications of *high hedonic well-being* (1) versus *no high hedonic well-being* (0) and *high eudaimonic well-being* (1) versus *no high eudaimonic well-being* (0).

We performed all analyses with both unweighted and weighted data. The weight factor was constructed based on gender, age, cohabitation status, employment status, educational level, place of birth, urbanization level and the weight factor in the first wave (de Graaf et al., 2013a; de Graaf et al., 2010; de Graaf et al., 2012). In this paper, we only report the unweighted data because the differences between the unweighted data and weighted data were negligible. All analyses were performed with SPSS 21.0. An alpha of .001 was applied due to the large sample size.

Results

Our first aim was to generate estimates of the prevalence of flourishers, languishers and the moderately mentally healthy. These estimates in the general Dutch population showed that 36.5% were flourishers, 1.6% were languishers, and the majority had moderate mental health (61.9%). We also found that 78.3% of the Dutch population possessed high hedonic well-being and 38.2% possessed high eudaimonic well-being (Table 1). In our sample, a combination of high hedonic well-being and non-high eudaimonic well-being was more frequent (41.8%) than a combination of high eudaimonic well-being and non-high hedonic well-being (1.8%).

Due to the lack of languishers in our study, languishers and the moderately mentally healthy were joined into a single category of non-flourishers. In the subsequent analyses, non-flourishers were contrasted with flourishers.

Table 1. Prevalence of combinations of high/non-high hedonic well-being and high/non-high eudaimonic well-being ($N = 5303$)

	Non-high hedonic well-being (%)	High hedonic well-being (%)	
Non-high eudaimonic well-being	19.9	41.8	61.8
High eudaimonic well-being	1.8	36.5	38.2
	21.7	78.3	

The second aim of our study was to examine the characteristics of flourishers. As shown in Table 2, flourishing was significantly associated with all socio-demographics ($p \leq .001$), except for urbanization level. The flourishing group contained relatively younger individuals, more females and higher educated individuals compared to the non-flourishing group. Flourishers were less likely to live alone, and they were more often in paid employment than non-flourishers. Of all socio-demographic categories, the highest percentage of flourishers was found in the youngest age category of 18–24 years (45.2%).

The same patterns emerged when examining high levels of either hedonic well-being or eudaimonic well-being (data not in Table). However, high hedonic well-being was not significantly associated with younger age and higher education. High eudaimonic well-being was not significantly associated with gender and all living situation categories, but individuals with high eudaimonic well-being were less likely to live alone when contrasted with not living alone ($p = .001$). Urbanization level did not reach statistical significance in any test.

Pearsons correlation coefficients were used to examine the associations between flourishing, personality traits and the situational factors of social support, life-events and physical health status (Table 3). All variables, except negative life-events, correlated significantly with flourishing ($p < .001$). A medium effect was found for conscientiousness ($r = .28$), while small to medium effects were found for extraversion ($r = .22$), neuroticism ($r = -.18$) and social support ($r = .16$). Although almost all inter-correlations were statistically significant, correlations were low with small or small-to-medium effects. To summarize, flourishers were mainly characterized by high levels of conscientiousness and extraversion, and low levels of neuroticism. Physical health status and positive life-events were weakly associated with flourishing.

When examining the correlations between either high hedonic well-being or high eudaimonic well-being and the independent variables (data not in Table), the same conclusions were drawn except for a significant association between high hedonic well-being and negative life-events ($r = -.06$) and a non-significant association between high hedonic well-being and positive life-events ($p = .10$).

Results of the stepwise multiple logistic regression analysis showed that the full model with socio-demographics, personality traits and situational factors significantly explained 19% of the variance in flourishing (Omnibus $X^2 = 764.47$, $df = 12$, $p < .001$). Sociodemographics (step 1) explained around 2% of the variance in flourishing (Table 4). In agreement with our expectations, we found that the personality traits (step 2) were most strongly related to flourishing with an additional R^2 of 15%. The situational factors (step 3) also added to the explained variance in flourishing when controlling for socio-demographics and personality traits ($\Delta R^2 = 1\%$).

Table 2. Descriptives of flourishers and non-flourishers ($N = 5303$)

<i>Socio-demographics</i>		Flourishers ($n = 1935$) n (%)	Non-flourishers ($n = 3368$) n (%)	p
Age (M ; SD) ^a		46.3 (12.6)	48.4 (12.2)	<.001
Age categories ^b	18-24	90 (45.2)	109 (54.8)	<.001
	25-34	308 (42.5)	416 (57.5) ^c	
	35-44	481 (38.9)	754 (61.1)	
	45-54	482 (35.5)	874 (64.5)	
	55+	574 (32.1)	1,215 (67.9) ^c	
Gender ^b	Male	814 (34.2)	1,566 (65.8)	.001
	Female	1,121 (38.4)	1,802 (61.6)	
Education ^b	Primary education	62 (27.4)	164 (72.6)	<.001
	Lower secondary education	430 (31.0)	958 (69.0) ^c	
	Higher secondary education	630 (36.5)	1,098 (63.5)	
	Higher professional education, University	813 (41.5)	1,148 (58.5) ^c	
Living situation ^b	With partner and children	820 (39.3)	1,267 (60.7) ^c	<.001
	With partner without children	602 (36.1)	1,064 (63.9)	
	Single parent	104 (36.2)	183 (63.8)	
	Alone	328 (30.8)	736 (69.2) ^c	
	With parents	61 (40.7)	89 (59.3)	
	With other(s)	20 (40.8)	29 (59.2) ^c	
Living situation (recoded) ^b	Alone	328 (30.8)	736 (69.2)	<.001
	Not alone	1,607 (37.9)	2,632 (62.1)	
Job ^b	Not in paid employment	442 (30.9)	988 (69.1)	<.001
	In paid employment	1,493 (38.5)	2,380 (61.5)	
Urbanization ^b	Small village	278 (40.5)	408 (59.5)	.133
	Village	400 (34.6)	755 (65.4)	
	Town	406 (35.6)	733 (64.4)	
	Small city	488 (37.0)	832 (63.0)	
	Big city	363 (36.2)	640 (63.8)	

^a Differences between groups tested with ANOVA.^b Differences between groups tested with χ^2 -test on all categories.^c Statistically significant difference between groups for this category compared to the other categories ($p < .001$)

Table 3. Pearson’s correlations between flourishing, personality traits and situational factors (N = 5303).

	M (SD)	Flourishing	E	N	C	SS	NLE	PLE
Personality traits (range)								
Extraversion (0-12)	8.5 (3.0)	.22*						
Neuroticism (0-12)	2.4 (2.6)	-.18*	-.25*					
Conscientiousness (12-60)	45.8 (5.3)	.28*	.20*	-.23*				
Situational factors (range)								
Social support (1-4)	3.4 (0.6)	.16*	.15*	-.23*	.17*			
Negative life-events (0-5)	0.7 (0.9)	-.01	.01	.10*	-.04	-.07*		
Positive life-events (0-4)	0.5 (0.8)	.07*	.07*	.08*	.00	-.01	.24*	
Physical health status (0-100)	50.7 (8.9)	.06*	.06*	-.15*	.09*	.11*	-.13*	-.03

* $p < .001$

M = Mean, SD = Standard deviation, E = Extraversion, N = Neuroticism, C = Conscientiousness, SS = Social support, NLE = Negative life-events, PLE = Positive life-events.

Table 4. Logistic regression coefficients related to flourishing, high hedonic well-being and high eudaimonic well-being (*n* = 5135).

	Flourishing		High hedonic well-being		High eudaimonic well-being	
	<i>b</i>	<i>OR</i> ¹ (95% CI)	<i>b</i>	<i>OR</i> ¹ (95% CI)	<i>b</i>	<i>OR</i> ¹ (95% CI)
Step 1: Socio-demographics						
Age	-.01	0.99 (0.99 – 1.00)	.00	1.00 (0.99 – 1.01)	-.01	0.99 (0.99 – 1.00)
Gender	.24	1.27 (1.12 – 1.44)*	.36	1.43 (1.23 – 1.66)*	.19	1.21 (1.06 – 1.37)
Education	.14	1.15 (1.07 – 1.24)*	-.01	0.99 (0.91 – 1.07)	.16	1.17 (1.09 – 1.26)*
Living situation	.01	1.01 (0.86 – 1.19)	.34	1.40 (1.18 – 1.66)*	-.08	0.93 (0.79 – 1.09)
Job	-.03	0.97 (0.82 – 1.14)	-.08	0.92 (0.77 – 1.11)	-.07	0.93 (0.79 – 1.10)
		<i>R</i> ² = .023*		<i>R</i> ² = .027*		<i>R</i> ² = .022*
Step 2: Personality traits						
Extraversion	.11	1.12 (1.10 – 1.15)*	.05	1.05 (1.03 – 1.08)*	.12	1.13 (1.10 – 1.15)*
Neuroticism	-.11	0.90 (0.87 – 0.92)*	-.15	0.87 (0.84 – 0.89)*	-.10	0.90 (0.88 – 0.93)*
Conscientiousness	.11	1.11 (1.10 – 1.13)*	.08	1.08 (1.07 – 1.10)*	.11	1.11 (1.10 – 1.13)*
		$\Delta R^2 = .154^*$		$\Delta R^2 = .126^*$		$\Delta R^2 = .157^*$
Step 3: Situational factors						
Social support	.34	1.40 (1.25 – 1.57)*	.41	1.51 (1.34 – 1.70)*	.35	1.42 (1.27 – 1.59)*
Negative life-events	-.02	0.98 (0.91 – 1.06)	-.11	0.89 (0.82 – 0.97)	-.02	0.99 (0.92 – 1.06)
Positive life-events	.19	1.20 (1.11 – 1.31)*	.14	1.15 (1.04 – 1.27)	.19	1.21 (1.12 – 1.32)*
Physical health status	.00	1.00 (1.00 – 1.01)	.01	1.01 (1.00 – 1.02)	.00	1.00 (1.00 – 1.01)
		$\Delta R^2 = .012^*$		$\Delta R^2 = .018^*$		$\Delta R^2 = .013^*$

* *p* < .001. *OR* = Odds Ratio. *R*² = Nagelkerke *R*². Results are for the final model.

When we determined the unique relationships of the individual variables with flourishing, we included both categorical and continuous variables with different ranges in scores in the logistic regression analysis. As a result, the odds ratios do not reflect true differences in the strength of the relationships. For this purpose, the Wald statistic was used to designate the strongest variables. Our results showed that flourishing was most strongly associated with conscientiousness [Wald X^2 (1) = 239.32], extraversion [Wald X^2 (1) = 92.02], neuroticism [Wald X^2 (1) = 52.08], social support [Wald X^2 (1) = 33.72] and positive life-events [Wald X^2 (1) = 18.79]. Age, living situation, employment situation, negative life-events and physical health status were not significantly associated with flourishing in the full model.

The regression analysis with flourishing as a dependent variable was compared to analyses with either high hedonic well-being or high eudaimonic well-being as a dependent variable. The full regression models explained 17% of the variance in high hedonic well-being (Omnibus X^2 = 601.03, df = 12, p < .001) and 19% of the variance in high eudaimonic well-being (Omnibus X^2 = 784.34, df = 12, p < .001). High hedonic well-being was most strongly associated with conscientiousness [Wald X^2 (1) = 121.33], neuroticism [Wald X^2 (1) = 101.44], social support [Wald X^2 (1) = 47.64], gender [Wald X^2 (1) = 22.31] and extraversion [Wald X^2 (1) = 17.91], while the same rank order was found for high eudaimonic well-being as compared to flourishing with the strongest relationships for conscientiousness [Wald X^2 (1) = 242.10], extraversion [Wald X^2 (1) = 102.90], neuroticism [Wald X^2 (1) = 47.59], social support [Wald X^2 (1) = 36.88] and positive life-events [Wald X^2 (1) = 20.76]. Of all significant relationships, most differences were found between high hedonic well-being and flourishing. Flourishing showed a positive relationship with higher education and positive life-events, while these factors were not significantly related with high hedonic well-being. An opposite pattern was found for living situation, indicating that individuals with high hedonic well-being were less likely to live alone, and that living situation was not significantly associated with flourishing. The only difference found between high eudaimonic well-being and flourishing was the factor of gender, which was significant for flourishing (i.e. women were more likely to flourish) but not for high eudaimonic well-being. We also performed regression analyses with an additional step in the high hedonic and high eudaimonic analyses—controlling for the other domain—which led to the same overall conclusions.

Discussion

The aim of this study was to estimate the prevalence of flourishing in a large representative adult population sample in The Netherlands and to examine various factors associated with this optimal mental health state. Flourishers have high levels of both hedonic well-being and eudaimonic well-being, and in the current study we compared this flourishing state with having high levels of either hedonic well-being or eudaimonic well-being.

Prevalence of flourishing

Our study revealed that 36.5% of the Dutch were flourishers and 1.6% were languishers. The prevalence of flourishing was almost the same as for having high eudaimonic well-being (38.2%), while the vast majority of individuals in The Netherlands possessed high hedonic well-being (78.3%). The fact that we used another instrument, the 14-item MHC-SF, is a likely explanation for the discrepancy between the amount of flourishers in the current study and the 20% flourishers found for the Netherlands by Huppert and So (2013). A recent study by Hone and colleagues (2014) has demonstrated that Huppert and So's framework revealed conservative estimates of flourishing compared to the MHC-SF and other instruments that assess flourishing. In the same population sample in New Zealand, Hone and colleagues (2014) found that the prevalence of flourishing ranged from 24%, when measured with Huppert and So's framework, to 39% with the MHC-SF, 41% with the Flourishing Scale (Diener et al., 2009) and 47% with the PERMA Profiler (Seligman, 2011). We also found considerably more flourishers and less languishers than has been found in the US (Keyes, 2002): 18% flourishers and 17% languishers) and in South Africa (Keyes et al., 2008): 20% flourishers and 12% languishers). However, these results should be interpreted with care because the assessment and categorization method for flourishing differed from our study (Keyes, 2002) or the sample was non-representative (Keyes et al., 2008).

To our knowledge, the prevalence of high hedonic well-being and high eudaimonic well-being have not been reported before. Based on our sample, it seems that it is relatively easy for the Dutch to meet the hedonic criteria of flourishing: scoring high on at least one of the three emotional well-being items (Keyes, 2006; Keyes et al., 2008). This cut-off value for high hedonic well-being could be debated, since it is based on US data and originates from a study wherein a variety of instruments assessed well-being (Keyes, 2002). More specifically, individuals had to score high on the six-item positive

affect scale or they had to score high on one question about life-satisfaction to meet the hedonic well-being criteria for flourishing (Keyes, 2002; Keyes, 2005). Nonetheless, different world rankings showed that, of 156 countries, The Netherlands ranks fourth for happiness (i.e. positive affect, negative affect and life-satisfaction) (Helliwell, Layard, & Sachs, 2013) and, of 149 countries, fifteenth for life-satisfaction (Veenhoven, 2010). The high level of hedonic well-being in The Netherlands could be a result of socio-economic advantages and culturally specific indicators such as a lower level of national income inequality, higher levels of individualism, social equality and human rights. These factors have been found to predict national subjective well-being (Diener et al., 1995), but it remains unknown if these factors are also relevant for eudaimonic well-being and flourishing.

Whereas almost 80% of the population of this study sample possessed high levels of hedonic well-being, only 38% possessed high levels of eudaimonic well-being. Thus, the prevalence of flourishing seems almost completely explained by the amount of high eudaimonic well-being. This finding seems in contrast with previous studies. For example, the highest average scores in the US and South Africa were for psychological well-being and social well-being (Keyes, 2005; Keyes et al., 2008), and in seven prosperous countries, participants reported higher levels for meaningfulness than they did for happiness and life-satisfaction (Delle Fave, Brdar, Freire, Vella-Brodrick, & Wissing, 2010). Further, we found an asymmetrical relationship between hedonic well-being and eudaimonic well-being as has previously been found by Waterman (1993; Waterman, Schwartz, & Conti, 2008). That is, while high hedonic well-being was also experienced with non-high eudaimonic well-being (41.8%), the reverse was less common (1.8%). However, our findings are in contrast with prior research wherein more equal groups were found (Huta & Ryan, 2009; Keyes et al., 2002). Since our study was correlational in nature, causal relationships between hedonic and eudaimonic well-being—or possible reciprocal relationships as proposed by Kashdan, Biswas-Diener and King (2008)—has yet to be studied.

Characteristics of flourishers

As expected, of all the included variables in the regression analysis, personality traits were most strongly related to flourishing. Flourishers were characterized by higher levels of conscientiousness and extraversion and a lower level of neuroticism, which was in contrast with the majority of studies that found the strongest relationships for neuroticism or extraversion (Demir & Weitekamp, 2006; Diener & Seligman, 2002;

Huppert, 2009; Lamers et al., 2012b; Lyubomirsky et al., 2005b; Rentfrow, Mellander, & Florida, 2009; Steel et al., 2008). A possible explanation for the strong relationship of conscientiousness found in our study could be that conscientiousness was measured at the same time as flourishing, while extraversion and neuroticism were measured three years earlier. While most researchers have concentrated their work on hedonic well-being and on the personality traits of neuroticism and extraversion (DeNeve & Cooper, 1998; Steel et al., 2008), our findings suggest that conscientiousness might have a stronger relationship with flourishing than previously thought. In fact, by definition, conscientious individuals are characterized by setting challenging goals for themselves and maintaining the discipline necessary to achieve those goals. These specific characteristics of conscientiousness might be especially relevant for flourishers, since most operationalizations of these constructs contain an engagement component (Hone et al., 2014).

The variance in high well-being and flourishing was least explained by socio-demographics. This finding is in agreement with previous empirical studies about predictors of well-being (Demir & Weitekamp, 2006; Lamers et al., 2012b). We found gradual patterns from more flourishers in younger age groups to less flourishers in older age groups, and from more flourishers with higher education to less flourishers with lower education. This pattern for education is in accordance with Keyes and Simoes (2012), but they found a pyramid pattern for age with the highest percentage of flourishers in the 45–54 age group and the lowest percentages of flourishers in the younger age groups. In the full regression model of our study, only higher education continued to be significantly related to flourishing. Furthermore, we found that female gender was significantly related to flourishing, which is in contrast with Keyes and Simoes' (2012) finding that male gender was significantly associated with flourishing.

To the best of our knowledge, this is the first study to describe the relationship between flourishing and the situational factors of social support, life-events and physical health status. We found that social support and positive life-events contributed significantly to the explained variance in flourishing, after controlling for socio-demographics and personality traits. Previous studies have shown the great importance of social support for the experience of well-being (Barry, 2009; Caunt et al., 2012; Demir & Weitekamp, 2006; Diener & Seligman, 2002; Diener & Seligman, 2004; Huppert, 2009; Keyes, 1998; Lehtinen et al., 2005), and the present study provided additional evidence with respect to the experience of flourishing. A remarkable finding of our study was that positive life-events, but not negative life-events, showed a relationship with flourishing.

Little is known about the effects of positive life-events on well-being and flourishing since the study of negative life-events predominates the literature. Nevertheless, Roepke (2013) recently reported that positive events had the similar effects on growth as negative events. That is to say, greater growth was experienced after more meaningful events or after events in which the participants were strongly engaged, independent from the event being positive or negative in nature. Although our results suggest that positive life-events have an impact on flourishing and that being confronted with negative life-events does not, more studies are needed to replicate these results. Finally, compared to previous studies, it is somewhat surprising that we did not found a relationship between physical health status and flourishing (Keyes, 2002; Keyes, 2005, 2007; Lamers et al., 2012a). It could be that our measure of physical health status is genuinely different from other indicators of physical health such as physical impairment in daily activities or the presence of chronic diseases and conditions.

We were also interested in exploring differences and similarities between the characteristics of flourishers and the characteristics of having high levels of either hedonic well-being or eudaimonic well-being. Our logistic regression results suggest that high hedonic well-being is genuinely different from the state of flourishing, while high eudaimonic well-being showed strong parallelism with flourishing characteristics. However, there was also considerable overlap in that personality traits explained most of the variance in the dependent variables, and that the situational factors (mainly social support) explained additional variance above and beyond personality traits and socio-demographics. Our findings correspond with recent theories and empirical evidence that, rather than studying either domain alone, the investigation of both hedonic and eudaimonic well-being provides more insight into the multifaceted construct of well-being (Henderson et al., 2013; Huta & Ryan, 2009; Kashdan et al., 2008; Peterson et al., 2005; Seligman, 2011; Waterman, 2008). For the pursuit of the highest levels of well-being (i.e. flourishing), characteristics associated with high eudaimonic well-being seem to be decisive. However, this topic warrants more research that engages other samples and various instruments.

Strengths and limitations

This study adds to the literature in that most of the research in the field of positive psychology has focused on hedonic or eudaimonic well-being instead of on their combination and, more specifically, on the combination of the highest levels of well-being. Two major strengths of the present study are that we: (1) used a large national representative study in a non-English speaking country and (2) included situational factors in explaining flourishing. As these factors are, to some extent, more modifiable, they may be of interest for public mental health and policy. We were also able to use the MHC-SF, a widely validated and reliable instrument to measure well-being and flourishing. In this way, we could compare our results with previous studies that had also used this instrument. Finally, to our knowledge, we were the first to compare flourishing with having high levels of either hedonic or eudaimonic well-being.

The results of our study are limited by the use of a cross-sectional design, which makes it difficult to draw conclusions about causality. However, educational attainment, extraversion and neuroticism were measured during the first wave and, therefore, not measured cross-sectionally. Our results are also limited by the use of a binary classification of high hedonic well-being and high eudaimonic well-being instead of continuous measures. Our main interest was to examine flourishing, which is essentially a categorical variable (Hone et al., 2014; Huppert & So, 2013; Keyes, 2002; Keyes et al., 2002). For reasons of direct comparison, we applied the same criteria to each well-being construct.

Practical implications and future research

The findings of the current study have implications for future research and practice. First, whereas governments are now increasingly interested in well-being research to refine their policy (Barry, 2009; Forgeard, Jayawickreme, Kern, & Seligman, 2011), most nationwide population studies include only hedonic well-being measures (Biswas-Diener, Vittersø, & Diener, 2009). Our research indicates that conclusions about the prevalence and characteristics of high levels of well-being depends on which well-being domain is measured. We recommend researchers to either include measures of flourishing or eudaimonic well-being besides measures of hedonic well-being. In order to compare prevalent rates of flourishing among nations and to further unravel determinants of flourishing, it seems essential to reach a consensus about a preferred flourishing instrument with validated cut-off points in a variety of countries. Future

validation studies could examine optimal criteria for having the highest prevalence of flourishing together with the lowest prevalence of mental illness.

Second, to attain the ultimate goal for the future that by the year 2051, 51% of the world population should be flourishing (Seligman, 2011), more research is needed to find specific and modifiable antecedents of flourishing that could then be addressed in new interventions. Based on our study, hypotheses for future research might explore beneficial pathways to flourishing such as strengthening social support, savoring positive life-events and the use of specific characteristics of conscientiousness like goal-striving. However, longitudinal designs are necessary to examine predictors of flourishing. In addition, experience sampling studies could also be relevant to identifying modifiable—and theoretically relevant—antecedents of flourishing, and to gain insight into the processes involved into daily flourishing activities and the influence of social support and (positive) life-events. For example, future studies could use the Day Reconstruction Method or diary method and include measures of positive emotion, engagement, positive relationships, meaning and accomplishment, which are the ingredients of flourishing according to the Well-being Theory of Seligman (2011). Since we found strong relationships between personality traits and flourishing, it would also be interesting to examine how these traits interact with antecedents of flourishing. Next, experimental intervention studies are needed to investigate which modifiable factors may contribute to achieving a state of flourishing and which target groups would benefit most.

Third, in our sample, wherein 78% of the Dutch population possessed high hedonic well-being, it seems fruitful to put most effort in increasing the level of eudaimonic well-being to promote flourishing in The Netherlands. This approach would be in line with the eudaimonic living model based on the self-determination theory (Ryan et al., 2006), which assumes that the basic needs for competence, autonomy and relatedness are required for flourishing (Deci & Ryan, 2000). However, previous studies using continuous measures of well-being found contradicting results with regard to which well-being domain is better or most beneficial. For example, when researchers pre-defined daily activities as promoting hedonic or eudaimonic well-being, more engagement in eudaimonic activities were found (Steger, Kashdan, & Oishi, 2008). But when individuals themselves indicated daily activities as promoting hedonic or eudaimonic well-being, they engaged more often in hedonic activities (Henderson et al., 2013). There are also indications that the pursuit of hedonic well-being activities (i.e. those that enhance feeling good and relaxation) increases short term well-being, whereas

the pursuit of eudaimonic well-being activities (i.e. those that enhance excellence and growth) leads to long term well-being (Huta & Ryan, 2009). In addition, positive emotions (i.e. hedonic well-being) seem to create upward spirals to more eudaimonic activities which eventually leads to flourishing (Catalino & Fredrickson, 2011; Fredrickson & Losada, 2005). More research is needed to identify differences and similarities between (high) hedonic well-being, (high) eudaimonic well-being and flourishing.

To conclude, the Dutch seem to be a flourishing population compared to other nations such as the US, but the prevalence of flourishing warrants further examination in a variety of countries. Whereas personality traits were most strongly associated with flourishing, the situational factors of social support and positive life-events were also important in explaining the variance of flourishing. We found considerable overlap when we compared the characteristics of flourishers with the characteristics of either high hedonic or high eudaimonic well-being, but high hedonic well-being was most discriminative from flourishing in prevalence and characteristics. Future studies are needed to confirm our findings. More research is especially needed to establish a preferred instrument and culturally valid cut-off points for the assessment of flourishing, which can then be used to further unravel the prevalence and characteristics of flourishers worldwide.

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Chapter 3

The Longitudinal Relationship between Flourishing Mental Health and Incident Mood, Anxiety and Substance Use Disorders

This chapter is submitted as:

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. *European Journal of Public Health*. doi: 10.1093/eurpub/ckw202

Abstract

Background: High levels of mental well-being might protect against the onset of mental disorders but longitudinal evidence is scarce. This study examines whether flourishing mental health predicts first-incidence and recurrent mental disorders 3 years later.

Methods: Data were used from 4482 representative adults participating in the second (2010-2012) and third wave (2013-2015) of the Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2). Mental well-being was assessed with the Mental Health Continuum-Short Form (MHC-SF) at the second wave. The classification criteria of this instrument were used to classify participants as having flourishing mental health: high levels of both hedonic well-being (life-satisfaction, happiness) and eudaimonic well-being (social contribution, purpose in life, personal growth). DSM-IV mood, anxiety and substance use disorders were measured with the Composite International Diagnostic Interview (CIDI) 3.0 at all waves. Odds ratios of (first and recurrent) incident disorders were estimated, using logistic regression analyses adjusting for potential confounders.

Results: Flourishing reduced the risk of incident mood disorders by 28% and of anxiety disorders by 53%, but did not significantly predicted substance use disorders. A similar pattern of associations was found for either high hedonic and high eudaimonic well-being. Significant results were found for substance use disorders when life-events and social support were removed as covariates.

Conclusion: This study underscores the rationale of promoting mental well-being as a public mental health strategy to prevent mental illness. In wealthy European nations it seems fruitful to measure and pursuit a flourishing life rather than merely high levels of hedonic well-being.

Introduction

Promoting mental well-being has been recognized as the primary goal for public mental health in Europe (Forsman et al., 2015) because of its benefits for individual health and society (Chida & Steptoe, 2008; Hamar, Coberley, Pope, & Rula, 2015; Keyes & Grzywacz, 2005). Hedonic well-being has long been the focus in epidemiological research and consists of feelings of happiness, life-satisfaction and positive affect. Many well-being interventions have been developed to increase happiness, for example by keeping a diary of positive emotions (Bolier et al., 2013). However, mental well-being captures not solely hedonic well-being, but eudaimonic well-being as well. The latter often includes aspects of psychological well-being (e.g. purpose in life, self-acceptance, personal growth) and social well-being (e.g. social acceptance, social contribution) (Keyes, 2002; WHO, 2004). Eudaimonic well-being is more complex and can be elevated by activities like strengthening active listening skills, practicing mindfulness and performing acts of kindness (Schotanus-Dijkstra, Drossaert, Pieterse, Walburg, & Bohlmeijer, 2015). When people have optimal levels of both hedonic and eudaimonic well-being, they can be defined as having flourishing mental health. This status has been related to the most favorable health outcomes compared with having high levels of either hedonic or eudaimonic well-being and suggests that well-being interventions should focus both on feeling happy and doing well (Henderson, Knight, & Richardson, 2013; Keyes, 2007; Keyes, Dhingra, & Simoes, 2010; Keyes & Grzywacz, 2005; Peterson, Park, & Seligman, 2005).

Recent longitudinal evidence indicates that higher levels of mental well-being is protective for incident mental health problems (Grant, Guille, & Sen, 2013; Keyes et al., 2010; Lamers, Westerhof, Glas, & Bohlmeijer, 2015; Wood & Joseph, 2010). Hence, flourishing might contribute to the reduction of the global burden of mental illness mainly caused by mood, anxiety and substance use disorders (Whiteford et al., 2013). However, little is known about the protective role of flourishing in first-onset and recurrence of these mental disorders (Keyes et al., 2010). To address this gap in the literature, the present study tested the hypothesis that flourishing is a significant protective factor for a broad range of first-incident and recurrent mood and anxiety disorders as well as for substance use disorders in a representative sample during a 3-year time span. The current study also explores whether high hedonic or high eudaimonic well-being predict mental disorders independently.

Method

The national representative Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2) recruited adults aged 18-64, using a multistage and stratified random sampling of private households. In every eligible household, one person was randomly selected for a lay-administered face-to-face interview. NEMESIS-2 consists of three waves in which respondents were followed over time: T0 took place between November 2007 and July 2009 ($n=6646$, response rate 65.1%; average interview duration 95 minutes), T1 between November 2010 and June 2012 ($n=5303$, response rate 8.4%; average interview duration 84 minutes), and T2 between November 2013 and June 2015 ($n=4618$, response rate 87.8%; average interview duration 83 minutes). Attrition between T0 and T1 (de Graaf, van Dorsselaer, Tuithof, & ten Have, 2013) and between T1 and T2 (de Graaf, van Dorsselaer, Tuithof, & ten Have, 2015) was not significantly associated with any of the 12-month mental disorders at T0 controlled for sociodemographics, except for alcohol and drug dependence at T1 which were significantly related with attrition at T2 (de Graaf et al., 2015). The NEMESIS-2 study proposal was approved by an independent Medical Ethics Committee and all participants provided written informed consent. More details about the design has been described elsewhere (de Graaf, ten Have, & van Dorsselaer, 2010; de Graaf et al., 2013, 2015).

Mental well-being was assessed at T1 and T2. Mental disorders were assessed at all waves of which the T0 measured lifetime disorders and 12-months disorders and the T1 and T2 measured 3-years disorders and 12-months disorders. In this paper, we used data of mental well-being at T1 to predict incident mental disorders (any mood, anxiety or substance use disorder) at T2. These incident disorders were defined as having a first-incident disorder at T2 (individuals were free of any disorder as reported at T0 and T1) or a recurrent disorder at T2 (individuals had reported a mental disorder at T0 or T1 but had no mental disorder 12 months prior to T1). The total sample of the current study consisted of 4482 respondents because participants with any 12-month mental disorder at T1 were excluded.

Measures

The Dutch version of the 14-item Mental Health Continuum-Short Form (MHC-SF) has shown good psychometric properties (Keyes et al., 2008; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011) and captures three hedonic well-being items and eleven eudaimonic well-being items, scored on a 6-point scale ranging from 0 to 5. The

frequency of each “symptom” of mental well-being during the past four weeks was, in our study, answered with *never, rarely, sometimes, regularly, often* or *(almost) always*. These answer categories differ slightly from its original scale without losing its type of frequency, to make it easier for the respondents to recall. The classification framework of the MHC-SF was applied to our data, categorizing people into “flourishing”, “moderate mental health” or “languishing” (Keyes, 2002). Opposed to a diagnoses of major depression, flourishing mental health postulates scores of 4 or 5 on at least one item of hedonia (rather than anhedonia; items 1-3) and at least six items of positive functioning or eudaimonia (rather than malfunctioning; items 4-14) (Keyes et al., 2008). All other people were classified as “non-flourishing” due to few people with languishing mental health (1.6%) (Schotanus-Dijkstra et al., 2016). Furthermore, persons with flourishing mental health were compared with persons who scored high on the hedonic well-being criteria (vs non-high hedonic well-being) or high on the eudaimonic well-being criteria (vs non-high eudaimonic well-being). To maximize sample size, missing data on one or more items of the MHC-SF at T1 (6.1%: 282 items of 73 participants) were imputed by Hotdeck imputation using gender, age categories and educational attainment as predictor variables (Myers, 2011). Almost identical results were found when missing data were listwise deleted.

DSM-IV diagnoses were ascertained with the fully structured Composite International Diagnostic Interview (CIDI) 3.0 (Kessler & Ustun, 2004). The common disorders measured at all three waves were any mood disorder (major depression, dysthymia and bipolar disorder), any anxiety disorder (panic disorder, agoraphobia, social phobia, specific phobia and generalised anxiety disorder) and any substance use disorder (alcohol/drug abuse and dependence). For every category of disorders, populations at risk were calculated—defined as individuals without a 12-month mental disorder at T1.

Potential confounders of the association between mental well-being and mental disorders included the sociodemographics gender, age at T1, educational attainment, cohabitation status, having children, employment status (Keyes et al., 2010; Kinderman et al., 2015; Schotanus-Dijkstra et al., 2016; Wood & Joseph, 2010), but also having any physical disorder (Wood & Joseph, 2010), smoking in previous four weeks (Koivumaa-Honkanen, Kaprio, Honkanen, Viinamaki, & Koskenvuo, 2004), physically active in sports (Koivumaa-Honkanen et al., 2004), negative life-events (Schotanus-Dijkstra et al., 2016), positive life-events (Schotanus-Dijkstra et al., 2016) and perceived social support (Kinderman et al., 2015; Schotanus-Dijkstra et al., 2016).

Presence of one or more physical disorders was obtained from a standard checklist of 17 chronic physical disorders, treated or monitored by a medical doctor in the 12 months before T1 (e.g. asthma, diabetes, chronic back pain). Presence of one or more negative and positive life-events in the 12 months before T1 were, respectively, assessed with 9 items (e.g. death of a relative or friend, divorce) and 6 items (e.g. recovery from serious disease or injury of a relative or friend, financial advancement). Perceived social support from 3 resources (partner, family or friends, neighbours) was measured with two questions on instrumental and emotional support from each of these resources in the close network. These referred to the extent respondents could rely on them for help if they had a problem and could open up to them if they needed to talk about worries. The four response categories ranged from 1 (*not at all*) to 4 (*a lot*). Any perceived social support was calculated as the mean score from at least two resources—because not all respondents had a partner at the time of interview—taking the respondent's evaluation of it into account. All covariates were measured at T1, except for educational attainment which was measured at T.

Statistical analysis

All analyses were performed with SPSS 22.0 for Windows. Weighted percentages and means were obtained for all variables to describe the sample. Differences between individuals with flourishing and non-flourishing mental health, high hedonic and non-high hedonic well-being, and high eudaimonic and non-high eudaimonic well-being were examined, using χ^2 -tests and independent t-tests. Populations at risk were calculated for each DSM-IV category of disorders (mood, anxiety and substance use). Subsequently, 3-year incidence rates were calculated based on weighted data to adjust for household non-response at T0 and response rate differences among several sociodemographic groups at T0, T1 and T2 (de Graaf et al., 2013). The T2-weight factor ensures the generalizability of incident cases to the general Dutch population. Finally, logistic regression analyses were used to determine whether each mental well-being category (flourishing, high hedonic well-being and high eudaimonic well-being) predicted first-incident and recurrent mental disorders 3 years later. These analyses were performed with unweighted data because we wanted to explain rather than describe the influence of mental well-being on incident mental disorders. In total, 12 fully adjusted logistic regression models were performed, generating odds ratios for each incident mental disorder category. Potential confounders at T1 were included in the analyses if they were significantly associated ($p < .05$) with one or more mental disorder categories at T2 and with one or more mental well-being categories at T1.

Results

About one in three persons at risk for any mental disorder were categorised as having flourishing mental health (38.9%), with 8.7% possessing high hedonic well-being and 4.8% possessing high eudaimonic well-being. Among those at risk for any mental disorder, people with flourishing mental health were significantly younger, of female gender, higher educated and in paid employment compared to people with non-flourishing mental health (Table 1). Being physically active in sports, experiencing one or more positive life-events and perceiving more social support were also significantly more pronounced in people who were flourishing. Some of these significant associations were not found when examining high hedonic well-being separately (i.e. education, employment status, being physically active in sports, positive life-events) (not in Table). High hedonic well-being was also significantly and positively related with having children and non-smoking ($p < .05$). High eudaimonic well-being resemble flourishing mental health.

Table 2 shows the at risk populations and incident rates of mental disorders in the total sample and for flourishing versus non-flourishing. The incidence of any mental disorder was 11.5% in the total sample. Of the individual mental disorder categories, the highest incidence was observed for any anxiety disorder (6.3%). The 3-year incidence of each mental disorder category was significantly lower for flourishers than for non-flourishers ($p < .05$), except for any substance use disorder ($p = .077$). In the flourishing sample, the highest incidence rate was found for any mood disorder (4.3%), while in the non-flourishing sample this was observed for any anxiety disorder (7.8%).

We also calculated first and recurrent incident rates for individuals with high hedonic versus non-high hedonic well-being and for individuals with high eudaimonic versus non-high eudaimonic well-being (Table 3). Contrary to the results displayed in Table 2, all mental disorder categories did significantly differ between having high hedonic well-being and non-high hedonic well-being ($p < .01$), thus also for any substance use disorder. The highest incidence rate was found for any anxiety disorder (11.4%) among individuals with non-high hedonic well-being. For eudaimonic well-being, similar results were found compared with flourishing mental health.

Table 1. Sample characteristics of respondents at risk for any mental disorder across flourishing ($n = 1593$) and non-flourishing ($n = 2509$) mental health at T1

	Flourishing n (%)	Not flourishing n (%)	p^b
Gender (male)	662 (46.0)	1202 (54.0)	<.001
Age (years)	44.36±13.03	46.43±12.75	<.001
21-27	111 (11.7)	130 (9.1)	
28-37	272 (21.9)	333 (17.0)	
38-47	418 (24.1)	653 (25.5)	
48-57	395 (23.4)	632 (25.0)	
58+	397 (18.9)	761 (23.5)	<.001
Educational attainment ^a			
Primary-basic vocational	46 (4.8)	114 (6.7)	
Lower secondary	351 (2.3)	702 (22.8)	
Higher secondary	498 (4.6)	789 (41.7)	
Higher professional-University	698 (34.2)	904 (28.8)	<.001
Cohabitation status (with partner)	1205 (75.2)	1822 (72.7)	.088
Having children			
No children	365 (28.1)	615 (28.4)	
Children living at home	762 (48.1)	1081 (45.2)	
Children not living at home	466 (23.8)	813 (26.4)	.123
Employment status (paid employment)	1220 (79.1)	1810 (74.5)	.001
Smoking last month (presence)	365 (24.8)	605 (24.1)	.626
Physically active in sports (presence)	1024 (64.7)	1536 (6.0)	.003
Physical disorder (presence)	641 (38.6)	1059 (39.1)	.736
Negative life-events (presence)	695 (42.1)	1107 (44.1)	.235
Positive life-events (presence)	712 (46.2)	916 (38.1)	<.001
Social support	3.50±.53	3.35±.58	<.001

a. Measured at T0, while all other variables were measured at T1

b. Significant differences between flourishing and non-flourishing using χ^2 -tests and independent t-tests.

Table 2. Three-year incidence rates of mental disorders at T2 for the total sample, and respondents with flourishing and non-flourishing mental health at T1

	Total sample		Flourishing		Not flourishing		<i>p</i>
	At risk population <i>n</i>	3-year incidence <i>n</i> (%)	At risk population <i>n</i>	3-year incidence <i>n</i> (%)	At risk population <i>n</i>	3-year incidence <i>n</i> (%)	
Any mood disorder	4391	247 (5.5)	1675	77 (4.3)	2716	170 (6.2)	.004
Any anxiety disorder	4338	240 (6.3)	1659	58 (3.9)	2679	182 (7.8)	<.001
Any substance use disorder	4482	138 (4.2)	1660	39 (3.5)	2822	99 (4.6)	.077
Any mental disorder	4102	442 (11.5)	1593	142 (9.2)	2509	300 (13.0)	<.001

Incidence includes first and recurrent incident cases.
n is unweighted data, % is weighted data.

Table 3. Three-year incidence rates of mental disorders at T2 for respondents with high hedonic vs. non-high hedonic well-being and high eudaimonic vs. non-high eudaimonic well-being at T1

	High hedonic well-being				Non-high hedonic well-being				High eudaimonic well-being				Non-high eudaimonic well-being			
	At risk		3-year incidence		At risk		3-year incidence		At risk		3-year incidence		At risk		3-year incidence	
	<i>n</i>	<i>n</i> (%)	<i>n</i>	<i>n</i> (%)	<i>n</i>	<i>n</i> (%)	<i>n</i>	<i>n</i> (%)	<i>n</i>	<i>n</i> (%)	<i>n</i>	<i>n</i> (%)	<i>n</i>	<i>n</i> (%)	<i>n</i>	<i>n</i> (%)
Any mood disorder	3545	168 (4.5)	846	79 (9.4)	<.001	1753	83 (4.4)	2638	164 (6.2)	.010						
Any anxiety disorder	3490	159 (5.0)	848	81 (11.4)	<.001	1736	67 (4.4)	2602	173 (7.6)	<.001						
Any substance use disorder	3551	94 (3.5)	931	44 (6.5)	.001	1738	43 (3.7)	2744	95 (4.5)	.188						
Any mental disorder	3347	326 (1.2)	755	116 (17.3)	<.001	1666	154 (9.6)	2436	288 (12.9)	.001						

Incidence includes first and recurrent incident cases.
n is unweighted data, % is weighted data.

The logistic regression models showed that flourishing significantly predicted any incident mental disorder 3 years later (OR = .69, 95% CI = .55 – .86, $p = .001$), controlling for a variety of potential confounders (Table 4). Flourishing was also significantly associated with decreased odds ratios of any mood disorder (OR = .72, 95% CI = .54 – .96, $p = .027$) and any anxiety disorder (OR = .47, 95% CI = .34 – .64, $p < .001$). In other words, flourishing reduced the risk of developing a mood disorder by 28% and for an anxiety disorder by 53% in a 3-year interval. The odds ratio of any substance use disorder revealed non-significant results ($p = .088$).

When examining high hedonic and high eudaimonic well-being as predictor of mental disorders, we found similar odds ratios as were found for flourishing mental health (Table 4). The largest difference was found in the odds ratios for any mood disorder, which was stronger for high hedonic well-being (OR = .52, 95% CI = .39 – .70, $p < .001$) compared with flourishing (OR = .72, 95% CI = .54 – .96, $p = .027$) and high eudaimonic well-being (OR = .75, 95% CI = .57 – 1.00, $p = .048$). These results might indicate that “having often or almost always a satisfying or happy life” is a better predictor of mood disorders than “having often or almost always a meaningful life”. However, merely 1.9% of the people possessed high eudaimonic well-being in the absence of high hedonic well-being, suggesting that the mental well-being categories were more similar than distinct in the current sample because almost all people with high eudaimonic well-being also possess high hedonic well-being, and are thus also flourishing. Notable, when positive life-events and social support were removed from the regression analyses, substance use disorders were significantly predicted by flourishing (OR = .66, 95% CI = .45 – .97, $p = .036$), high hedonic well-being (OR = .62, 95% CI = .43 – .91, $p = .015$) and high eudaimonic well-being (OR = .68, 95% CI = .46 – .99, $p = .042$), although with wide confidence intervals.

Table 4. Logistic regression predicting T2 incidence of mental disorder from T1 mental well-being adjusted for possible confounders, unweighted data

	Any 3-year incident mood disorder	Any 3-year incident anxiety disorder	Any 3-year incident substance use disorder	Any 3-year incident mental disorder
	Fully adjusted OR (95% CI)	Fully adjusted OR (95% CI)	Fully adjusted OR (95% CI)	Fully adjusted OR (95% CI)
Flourishing	.72 (.54 – .96)	.47 (.34 – .64)	.71 (.48 – 1.05)	.69 (.55 – .86)
High hedonic well-being	.52 (.39 – .70)	.48 (.36 – .64)	.68 (.46 – 1.01)	.62 (.49 – .79)
High eudaimonic well-being	.75 (.57 – 1.00)	.54 (.40 – .73)	.73 (.50 – 1.07)	.72 (.58 – .90)

OR, odds ratios; CI, confidence intervals. Significant results ($p < .05$) are in bold.

ORs were adjusted for gender, age, cohabitation status, having children, smoking in previous four weeks, physically active in sports, positive life-events and perceived social support.

Discussion

Our findings provide unique longitudinal evidence for the hypothesis that mental well-being predicts first-incidence and recurrent mental disorders in the general population. Flourishing mental health played a protective role in the development of any mood, anxiety and DSM-IV disorder 3 years later, although flourishing did not significantly predict any substance use disorder. Similar results were found for either high hedonic and high eudaimonic well-being as predictor of mental illness. The “two continua model” of mental health (Keyes, 2002) claims that mental well-being and mental illness are related yet present two distinct continua. So, people with a mental disorder can also possess high levels of happiness (Bergsma, Veenhoven, ten Have, & de Graaf, 2010) or flourishing mental health (Keyes, 2007; Keyes et al., 2010), and people with low mental well-being are not automatically diagnosed with a mental disorder (Bergsma et al., 2010; Keyes, 2007; Keyes et al., 2010). Numerous studies have provided evidence for this model, for example by demonstrating a different pattern of social and psychological factors associated with mental well-being than with mental health problems (Kinderman et al., 2015) and by revealing a bidirectional relationship between mental well-being and mental illness (Lamers et al., 2015). The present study underscores the importance of promoting mental well-being and protecting flourishing mental health in the general population besides alleviating mental suffering (Keyes, 2007).

Comparison with previous research

Our results corroborate with prior studies investigating the longitudinal relationship between mental well-being and mental disorders. Two of these studies were also conducted in a national representative adult sample. The first study assessed diagnostic criteria for major depression, generalised anxiety disorder and panic disorder in people aged 25-74 and investigated the change in mental well-being categories (e.g. improved from languishing to moderate mental health, declined from flourishing to moderate mental health, stayed flourishing) between 1995 and 2005 (Keyes et al., 2010). The other study assessed mental well-being and psychopathological symptoms on continuous scales, at four measurement times during 9 months (2007-2008) in people aged 18 and above (Lamers et al., 2015). Both studies demonstrated that the level of mental well-being significantly predicted mental illness later in time (Keyes et al., 2010; Lamers et al., 2015). Two other non-representative longitudinal studies showed that the absence of high well-being increased the risk for depression (Grant et al., 2013; Wood & Joseph, 2010). Taken

together, emerging longitudinal evidence emphasise the possibility of preventing mental illness by improving mental well-being.

The present study is the first to examine the longitudinal relationship between mental well-being and substance use disorders. High hedonic well-being preceded the reduced risk for any substance use disorder, although this was a marginal significant result which became stronger—and led to significant results for all mental well-being categories—when positive life-events and social support were not included in the regression models. This suggests that the non-significant results for substance use disorders might be explained by intercorrelations between positive life-events, social support and mental well-being. The few prior studies using Keyes' classification model in studying substance use disorders, showed contradicting results. For example, Low and colleagues (Low, 2011) found no significant cross-sectional association between alcohol consumption and flourishing in undergraduates, while other studies showed that flourishing was related to lower prevalence rates of alcohol dependence in a representative US sample (Keyes, 2005) and to be "abstinent for the past 30 days" in people who had attended treatment (McGaffin, Deane, Kelly, & Ciarrochi, 2015). Overall, our results seem most in line with a representative twin study wherein the genetic risk factors between mental well-being and internalizing psychopathology (e.g. mood disorders) were stronger related than that for externalizing psychopathology (e.g. alcohol problems) (Kendler, Myers, & Keyes, 2011). More research is needed to examine temporal associations between mental well-being and substance use disorders and the influence of positive life-events and social support on this relationship.

Strengths and limitations

The main strengths of our study comprises its longitudinal design and large national representative adult sample, the 3-year interval rather than a relatively short gap of 3 months during 9 or 12 months (Grant et al., 2013; Lamers et al., 2015) or a relatively long gap of 10 years (Keyes et al., 2010; Wood & Joseph, 2010), and the diagnostic interview for assessing mental disorders as well as mental well-being categories. Some limitations also apply which should be considered when interpreting our results. First, the incidence rates are based on self-reported lifetime disorders at T0 and 3-year mental disorders at T1 and T2. Especially the self-reported lifetime disorders could have been biased by inaccurate recall, which might have overestimated the reported incidence rates (Moffitt et al., 2010). Second, we were forced to use categories of mental disorders due to the relatively low level of incidence rates of the separate disorders on population level. The

same applies to the categories of mental well-being since the proportion of languishing mental health was too low to draw any firm conclusions. Third, cohort studies like ours are generally limited by sample attrition at follow-up.

Public health implications

This study provides further support for the importance of promoting mental well-being from a public mental health and clinical perspective as has been acknowledged by the World Health Organization (WHO, 2004) and by recent calls for broadening the scope of psychiatry (Jeste, Palmer, Rettew, & Boardman, 2015) and clinical psychology (Wood & Tarrier, 2010) to regain a more balanced focus on “the positive” alongside alleviating mental suffering. There is initial evidence that flourishing can be successfully promoted (Bohlmeijer, Lamers, & Fledderus, 2015; Schotanus-Dijkstra et al., Submitted) but more studies are needed. The current study suggests that flourishing mental health seems a more important predictor of mental disorders than either high hedonic or high eudaimonic well-being because of the similarity in decreased odds ratios and the fact that flourishing captures both feeling happy and functioning well in connection with themselves, others and society. Especially in countries like The Netherlands where the majority of citizens already exhibit high levels of hedonic well-being (Helliwell, Layard, & Sachs, 2016; Huppert & So, 2013; Schotanus-Dijkstra et al., 2016), it might be more rewarding to measure and enhance flourishing in the general population rather than either measuring and improving subjective well-being or psychological well-being which now predominates in the literature (Bolier et al., 2013; Helliwell et al., 2016; Weiss, Westerhof, & Bohlmeijer, 2016). Moreover, an innovative and new strategy for mental health promotion might be to encourage people in wealthy nations like The Netherlands to pursue a flourishing mental health status by including aspects of hedonic well-being such as savouring positive emotions, as well as aspects of eudaimonic well-being such as the use of character strengths in new ways or expressing gratitude to a loved one. Our findings indicate that such a strategy may help ameliorate the incidence and associated burden of mood and anxiety disorders in the general population.

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Chapter 4

Efficacy of a Multicomponent Positive Psychology Self-help Intervention: Study Protocol of a Randomized Controlled Trial

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Abstract

Background. Positive psychology interventions have been found to enhance well-being and decrease clinical symptomatology. However, it is still unknown how flourishing can also be increased. Although multicomponent interventions seem to be necessary for this purpose, different formats can be used. A cost-effective approach could be a positive psychology-based self-help book with tailored email support to reach large target groups and to prevent dropout.

Objective. This study will evaluate the efficacy of a comprehensive multicomponent self-help intervention with or without email support on well-being and flourishing, and will seek to determine the working mechanisms underlying the intervention.

Methods. In this 3-armed, parallel, randomized controlled trial, 396 participants with low or moderate levels of well-being and without clinical symptomatology will be randomly assigned to (1) a self-help book condition with weekly email support, (2) a self-help book condition without email support but with a weekly information email, or (3) a waiting list control condition. Online measurements will be assessed at baseline, at post-test (3 months after baseline), and at 6 and 12 months after baseline.

Results. The primary outcomes are well-being and flourishing (i.e., high levels of well-being). Secondary outcomes are the well-being components included in the intervention: positive emotion, use of strengths, optimism, self-compassion, resilience, and positive relations. Other measures include depressive and anxiety symptoms, personality traits, direct medical and non-medical costs, life-events, and client satisfaction.

Conclusions. This study will add knowledge to the efficacy and cost-effectiveness of a multicomponent positive psychology intervention. We will also explore who can benefit most from this intervention. If the intervention is found to be effective, our results will be especially relevant for public mental health services, governments, and primary care.

Introduction

Since the introduction of positive psychology in 1998 (Seligman & Csikszentmihalyi, 2000), the proportion of published studies on this topic has grown rapidly each year compared to the entire field of psychological research (Rusk & Waters, 2013). Researchers have argued that the study of positive psychology is more capacious than the field of psychopathology because its primary focus is not on dysfunction but on well-being and optimal functioning (Kobau et al., 2011). Recent evidence indicates that positive mental health and mental illness are related but different continua (Keyes, 2002; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011; Westerhof & Keyes, 2010). This so-called two-continua model implies that individuals can experience positive outcomes such as life-satisfaction, meaning, and personal growth when mentally ill, and that the absence of mental illness does not automatically imply high levels of positive mental health (Keyes, 2007; Keyes & Simoes, 2012). As a consequence, researchers have underscored the importance of enhancing positive mental health in addition to preventing and treating mental illness, in clinical populations as well as in the general population (Huppert, 2009; Kobau et al., 2011).

A central aim in positive psychology is to increase the amount of flourishing worldwide (Seligman & Csikszentmihalyi, 2000; Seligman, 2011). Flourishing is defined as the presence of high levels of the affective or “feeling good” dimension of well-being (i.e., hedonic well-being) in combination with high levels of the psychological functioning or “living well” dimension of well-being (i.e., eudaimonic well-being) (Huppert, 2009; Huppert & So, 2013; Keyes, 2002). Compared to “languishers” (i.e., people at the lowest levels of hedonic and eudaimonic well-being) and individuals with depression, research has shown that flourishers experience the least emotional distress and psychosocial impairment, have hardly any lost work days, and are most likely to survive (Keyes, 2002; Keyes & Simoes, 2012). Keyes and colleagues (2010) have found initial support for the hypothesis that an increase in well-being protects against the development of mental illness. More specifically, they found that the risk for having a mental disorder was equally lowest for individuals who were flourishing in 1995 and in 2005, and for individuals who were flourishing in 2005 but not in 1995 (Keyes et al., 2010). The same study also indicates that it is possible to enhance the amount of flourishing (Keyes et al., 2010). However, there seems to be significant room for improvement because epidemiological studies using the same operationalization of flourishing have found that there were only 17% flourishers in the United States (Keyes, 2002), 20% flourishers in South Africa (Keyes et al., 2008), and 37% flourishers in The Netherlands (Schotanus-Dijkstra et al., 2016). Some researchers theorize that even small

improvements in the level of well-being in the general population could generate large preventive effects on the amount of psychopathology (Huppert, 2009; Rose, 2008). Yet, little is known about how the amount of flourishing can be increased. The present study will evaluate a theory- and research-based positive psychology intervention (PPI) on efficacy, specific working mechanisms, and cost-effectiveness for enhancing well-being and flourishing in the general population.

Positive psychology interventions

A large number of theories have been used to develop interventions and exercises within the positive psychology movement, as can be found in the Key Competence Happiness Database (2014). Two meta-analyses have shown that PPIs significantly enhance well-being and alleviate depression in the short term, although effect sizes were relatively small (Bolier et al., 2013b; Sin & Lyubomirsky, 2009). These small effect sizes might be a result of the nature and intensity of the included interventions, which were mostly single-component interventions (i.e., one or more individual exercises targeting one component of well-being). Examples are “the three good things exercise” or “savoring” targeting positive emotion, and “using one’s strengths in new ways” to increase flow. However, since well-being is a multifaceted construct (Ryff, 1989; Seligman, 2011) it might be more efficacious to promote well-being and flourishing with a multicomponent intervention that contains a variety of evidence-based individual exercises targeting 2 or more theoretically relevant hedonic and eudaimonic well-being components. For example, the well-being theory of Seligman (Seligman, 2011) states that the components of positive emotion, engagement, relationships, meaning, and accomplishment (PERMA) are all necessary for flourishing. Also, multicomponent interventions are higher intensity, target more resources of well-being in an individual, and are often of longer duration than single-component interventions, which may increase their efficacy.

In the last decade, some multicomponent PPIs have been investigated, including different face-to-face interventions. Examples are (1) Positive Psychotherapy, a structured 14-session program developed for individual or group therapy in clinical settings based on Seligman’s well-being theory (Rashid, 2014; Seligman, Rashid, & Parks, 2006; Seligman, 2011), (2) Well-being therapy, an individual psychotherapeutic strategy of 8-12 sessions that is based on Ryff’s model of psychological well-being (1989) and therefore contains strategies and therapeutic techniques to influence the components self-acceptance, environmental mastery, positive relations with others, personal growth, autonomy, and purpose in life (Fava & Tomba, 2009), and (3) the Working for Wellness

Program, a structured 6-week group-based program for employees with a strong focus on strengths, flow, and social relationships (Page & Vella-Brodrick, 2012). The efficacy of these multicomponent PPIs on mental illness and positive mental health have been demonstrated in a wide variety of studies—including randomized controlled trials (RCTs)—although most of these studies used small samples (Fava & Tomba, 2009; Page & Vella-Brodrick, 2012; Rashid, 2014). However, the need for trained therapists in these intensive face-to-face PPIs is a disadvantage that may limit their feasibility, cost-effectiveness and dissemination.

Positive psychology exercises have the advantage of being relatively small and easy-to-implement in daily life, and are therefore well-suited for self-administered interventions. Recently, some Web-based multicomponent PPIs have been developed to increase the reach of PPIs. For example, Schueller and Parks (2012) selected 6 exercises from the Positive Psychotherapy intervention (active-constructive responding, gratitude visit, life summary, three good things, savoring, and strengths) and randomly assigned participants to a 6-week program containing all 6 exercises, 4 of the exercises, or 2 of the exercises. The 2- and 4-exercise programs resulted in significantly larger effects on depressive symptomatology than the control group and the 6-exercise program, although participants in the latter program practiced the exercises on significantly more days than participants in the 2- or 4-exercise programs (Schueller & Parks, 2012). Another, more comprehensive intervention is Psyfit. This intervention contains 6 modules, each with 4 lessons, about goal setting, positive emotion, positive relations, mindfulness, optimism, and mastery (Bolier et al., 2013a). An RCT showed significant but small effects on well-being and depressive symptomatology, although most participants completed less than 4 lessons of 1 or more modules (Bolier et al., 2013a). While these and other Web-based multicomponent PPIs have shown that they can reach many individuals, their cost-efficacy seem to be limited by low adherence rates (Bolier et al., 2013a; Bolier et al., 2014; Mitchell, Vella-Brodrick, & Klein, 2010; Schueller & Parks, 2012), which could be due to the lack of human contact and coaching (Mitchell et al., 2010; Riper et al., 2010).

Self-help book with email support

Another, possibly cost-effective approach could be to intertwine the advantages of the aforementioned formats by using an accessible self-help book in combination with email support to reach and stimulate large groups of individuals at minimal costs. Meta-analyses have shown that the use of self-help books—also called bibliotherapy—with or without support are effective in the treatment of depression (Cuijpers, 1997; Gregory, Schwer Canning, Lee, & Wise, 2004) and the treatment of alcohol problems (Apodaca & Miller, 2003). Also, research on guided self-help in the form of email support in combination with face-to-face therapy or online therapy has shown promising results (Barak, Klein, & Proudfoot, 2009; Cuijpers, Donker, van Straten, Li, & Andersson, 2010). Besides, there are some indications that tailored email support is more effective than no support or automated email support (Barak et al., 2009; Carter, Fergus, Ahmad, McLeod, & Stephen, 2015). More important, promising findings have been found for the use of positive psychology-based self-help books without any support (Fordyce, 1977, 1983; Parks & Szanto, 2013) or with email support (Fledderus, Bohlmeijer, Pieterse, & Schreurs, 2012). For example, Parks and Szanto (2013) compared a PPI group of students who received the book “The How of Happiness” (Lyubomirsky, 2007) to a group of students who received a cognitive behavioral self-help book to cope with depression and a control group. Results showed that both intervention groups were equally effective in reducing depressive symptoms at post-test compared to the control group, and that significant increases in life-satisfaction were found only for the PPI compared to the control condition at the 6-months follow-up. Another study used a multicomponent self-help book based on acceptance and commitment therapy in a sample with mild to moderate depressive symptomatology (Fledderus et al., 2012). One intervention group received the book with extensive and tailored email support on progress and process, while another group received the book with minimal email support on progress. Results revealed significant increases in well-being and mindfulness and significant decreases in depressive, anxiety, and fatigue symptomatology for both intervention groups at 3-months follow-up compared to a waiting list control group (Fledderus et al., 2012). In this study, we will use a version of the extensive email support similar to that used in the latter study (Fledderus et al., 2012). That is, participants will be guided through the self-help book by tailored email feedback from trained counselors, but we will compare it to receiving an information email instead of minimal email support.

This study

This study will examine a comprehensive multicomponent positive psychology-based self-help book with email support. The self-help book is entitled, “This is your life” (TL) (Bohlmeijer & Hulsbergen, 2013) and targets six key components in positive psychology: positive emotion, use of strengths, optimism, self-compassion, resilience, and positive relations. We will compare a condition wherein participants receive the book with weekly asynchronous and tailored email support (TL-E) to a condition wherein participants receive the book with a weekly email with information (TL-I). Both groups will be compared to a waiting list control condition (WL). Our research aim is to evaluate the efficacy of the multicomponent self-help book with or without email support in terms of well-being and flourishing in an RCT (NTR4297) and to evaluate which of the included well-being components in the self-help book contribute to its efficacy. We expect that TL-E will be equivalent or superior to TL-I and superior to WL at post-test and 6 months follow-up, and that the effects will be sustained at 12 months follow-up.

This study will add to current knowledge in 3 ways. First, it will be conducted in a sample with low or moderate levels of well-being without moderate or severe clinical symptomatology, which is a potential “happiness-seekers” group (Parks, Della Porta, Pierce, Zilca, & Lyubomirsky, 2012) that has not previously been studied in PPIs (Bolier et al., 2013b; Mitchell et al., 2010; Sin & Lyubomirsky, 2009). Second, this study will gain insight into the working mechanisms underlying the intervention by evaluating which of the included well-being components in the self-help book (i.e., positive emotion, use of strengths, optimism, self-compassion, resilience, and positive relations) contribute to its efficacy and by examining individual differences in demographic characteristics, number of life events, personality traits, and adherence rates. Third, this study will examine if the innovative format used in this study (i.e., self-help book with relatively inexpensive email support) is a cost-effective approach for enhancing well-being and flourishing compared to a waiting list control group, since little is known about the cost-effectiveness of PPIs (Bolier et al., 2014).

Methods

Study design

This study is a parallel RCT with 3 groups: a group receiving the self-help book with weekly asynchronous and tailored email support (TL-E); a group receiving the self-help book without email support but with a weekly information email (TL-I); and a waiting list control group (WL). Outcomes will be assessed at baseline (T0), post-test (around 3 months after baseline; T1), and at 6 (T2) and 12 months (T3) after baseline. All measurements will be self-reported and gathered via email with a link to a personal questionnaire built with Qualtrics software (Qualtrics, 2014). The design and procedures of this study were approved by the Ethics Committee of the University of Twente in The Netherlands (no. 13212).

Participants

Participants will be recruited from the general population in The Netherlands using newspaper advertisements. The recruitment messages will be positively framed: (1) “Get the best out of yourself and improve your resilience and well-being with a free self-help course”, and (2) “Become happy and stay happy? Improve your resilience and well-being with a free self-help course”.

Interested participants will be directed to a website with extensive information about the study and an application form. After applying, participants will be sent a personal link to a screening questionnaire on their specified email address. Participants who open the personal link will be asked to give online informed consent. If no informed consent is given, participants will be diverted to the information website and will not be able to participate in the study. If informed consent is given, participants will fill out the screening questionnaire before the start of the study. Figure 1 shows the intended flow-chart of participants.

Figure 1. Design of the study and intended flow-chart of participants.

Adults aged 18 or above with low or moderate levels of well-being without moderate or severe clinical symptomatology are eligible for this study because previous studies have shown that these individuals might search for happiness (Parks et al., 2012) and could boost their mental health by elevating the level of well-being (Keyes, 2007; Keyes & Simoes, 2012). Other inclusion criteria are a sufficient Internet connection, a valid email address, and a willingness to invest an average of 4 hours per week for 8-12 weeks. In the screening questionnaire, the Mental Health Continuum-Short Form (MHC-SF) will be used to assess the level of well-being and the Hospital Anxiety and Depression Scale (HADS) will be used to assess the level of clinical symptomatology. Participants will be excluded from the study if they score 4 or 5 (range 0-5) on at least 1 of the 3 emotional well-being items in combination with a score of 4 or 5 (range 0-5) on at least 6 of the 11 social and psychological well-being items of the MHC-SF, which is operationalized as flourishing (i.e., high levels of well-being) (Keyes, 2006; Keyes et al., 2008). Participants will also be excluded if they score above 10 (range 0-21) on the depression scale and/or on the anxiety scale of the HADS, which indicates individuals with moderate or severe clinical symptomatology (Zigmond & Snaith, 1983). Participants who will be excluded from the study will be notified by email because, (1) they are already flourishing, or (2) they probably have at least moderate depression or anxiety symptoms. The latter group will receive their specific scores and their meaning on the HADS and will be advised to talk to their general practitioner when symptoms persist or increase. After screening, the remaining participants receive a personal email link to the baseline questionnaire.

Randomization

Randomization will be conducted after all eligible participants complete the baseline questionnaire, with 396 participants being randomly assigned to 1 of the 3 groups (allocation ratio, 1:1:1). Randomization will be stratified by gender and educational level (i.e., low, medium, high) using a computerized random number generator created with Excel. This is an automated process with no interference from the investigators.

Interventions

This study will use the self-help book, “This is your life” (Bohlmeijer & Hulsbergen, 2013) in both experimental conditions. This book is mainly based on the overarching and comprehensive well-being theory of Seligman (Seligman, 2011) and Ryff’s theory of psychological well-being (Ryff, 1989). The book consists of eight modules on six key components in positive psychology: positive emotion; discovering and using strengths; optimism and hope; self-compassion; resilience and post-traumatic growth; and positive relations (Table 1). Each module contains psycho-education derived from specific theories and empirical evidence in positive psychology and related research areas. Each module also contains a number of positive psychology exercises, ranging from 3-10 per module. Most of these exercises are evidence-based, such as the “three good things exercise” (Bolier et al., 2013b; Sin & Lyubomirsky, 2009) and “imagine your best possible self” (Meevissen, Peters, & Alberts, 2011; Peters, Flink, Boersma, & Linton, 2010; Peters, Meevissen, & Hanssen, 2013). All modules are, in theory, effective independent strategies for enhancing well-being. Participants in the experimental groups will receive the self-help book by regular mail, accompanied by a time schedule for reading the book and practicing the recommended exercises (see Table 1). Participants will be instructed to read one module per week—except for module 2, which can be spread out over two weeks—in sequential order, and to practice the recommended exercises of that module. If the participant has more time, he or she can re-read the module and practice other exercises of that module. Participants will be encouraged to invest the most time in the exercises that feel most beneficial to them.

Participants will have 8-12 weeks to complete the 8 modules of the book to take holidays and other circumstances into account. When participants in the TL-E group need more than 9 weeks to complete the book, in consultation with the counselor, they will not receive email support in the weeks they are not in the position to work on a module. Participants in the TL-I group will receive weekly information emails during the first 9 weeks and will be asked to read the emails in chronological order in the weeks they actually work on a module. On average, participants in the experimental groups will be expected to invest 4 hours per week during the intervention period.

Table 1. Content of “This is your life” and recommended exercises for participants in the experimental conditions.

Module	Recommended exercises	Theoretical background
1. Positive emotions	<ul style="list-style-type: none"> • Diary of pleasant emotions: What happened, who was there, what did you feel, what did you thought? • Three good things: Think about three things that went well today and savor those moments. 	Fredrickson, 1998; 2001; 2009
2. Discovering strengths	<ul style="list-style-type: none"> • Overview of your strengths: Which of the 47 strengths do you have and which of these give you energy and pleasure? • Identify your strengths I: Answer the 10 questions (i.e., who inspires you?) that will help you to discover your strengths. • Identify your strengths II: Which strengths do you recognize in answering the 10 questions? • Vision of others: Ask 3-5 people about your top 5 strengths with examples from daily life. • Top 5 strengths: choose your top 5 strengths that also give you energy and pleasure. 	Linley & Biswas-Diener, 2010; Linley & Harrington, 2006
3. Use of strengths, flow	<ul style="list-style-type: none"> • Change “must” into “want”: Make a list of things you don’t like but must do. What are underlying intrinsic motivations? • Flow: Have you experienced flow and why? • Flow at the moment: How much flow did you experience the preceding week? When, how? • Challenge yourself: How can you create more flow in your life? Use your strengths in a new way. 	Csikszentmihalyi, 2001
4. Optimism, hope	<ul style="list-style-type: none"> • ABC-Diary: What do you think and do when something negative happens? How can you challenge favorite pessimistic thoughts? • Imagine your best possible self: Visualize yourself in the personal, relational, and professional domain. 	Carver, Scheier, & Segerstrom, 2010; Scheier & Carver, 1992; Seligman, 2006

Module	Recommended exercises	Theoretical background
5. Self-compassion	<ul style="list-style-type: none"> • Wish yourself something good: Be mindful and identify your greatest need at this moment. Use your inner voice to repeat your compassionate wish. • Develop a compassionate inner voice: Write 5 minutes about situations in the preceding week wherein you showed self-compassion. 	Gilbert, 2010; Neff, 2003a; Neff & Germer, 2013
6. Resilience	<ul style="list-style-type: none"> • Coping style: Take the test to identify your prominent coping style(s). • Expressive writing: Write 15 minutes on at least 4 days about emotions, thoughts, and feelings around a negative or positive event. • Needs: What are your specific needs at this moment? Who should know your needs? 	Joseph, 2011; Joseph & Linley, 2006; Tedeschi & Calhoun, 2004
7. Positive relations (I)	<ul style="list-style-type: none"> • Active-constructive responding: Respond positively to good news shared by others. Use active communication skills, how does the other react? • Listen compassionately: Try to use elements of compassionate listening, such as “What feelings and needs does the other express?” • Expressing gratitude: Write a gratitude letter and/or read it aloud to the person you are thankful to. 	Gable, Reis, Impett, & Asher, 2004; Reis & Gable, 2003; Reis et al., 2010; Rosenberg, 2003
8. Positive relations (II) and spirituality	<ul style="list-style-type: none"> • Relaxation/meditation: Relax by doing a “body scan”, physical exercise, or “stand like a tree”. • Reflect on your needs: What are your intrinsic goals, needs and motives? Do you live those needs and why (not)? • Acts of kindness: Rejoice somebody by performing an unexpected act of kindness or by doing volunteer work. 	Bloom, 2011; Otake, Shimai, Tanaka-Matsumi, Otsui, & Fredrickson, 2006

Email support

The TL-E group will receive weekly email support from a personal counselor. These counselors will be 5 senior positive psychology students of the University of Twente who completed a course on email counseling in which they are trained to guide a fellow student on using the self-help book “This is your life”. Each of these will guide 25 participants and the remaining participants will be guided by the first author (MS). Participants will be randomly assigned to 1 of the 6 counselors in the same manner as the randomization procedure outlined above (e.g., stratified by gender and educational level). Additional training will be given in a one-day workshop and via weekly supervision by authors MS and EB and a clinical psychologist. In these meetings, random emails of the counselors will be discussed to increase treatment integrity, and counselors can ask specific questions to the supervisors. The personal counselors will introduce themselves in an initial email sent the day participants receive the self-help book. The participants will be asked to introduce themselves before the email sessions start. Participants will be instructed to send a weekly email on Sunday or Monday wherein they write about their experiences with the scheduled module. Every Wednesday, the personal counselors will answer the emails.

The main goal of the email support is to encourage the participants to read the scheduled modules and practice the recommended exercises. The email support will be more process-oriented than content focused, and will be flexible within the boundaries of the structured time schedule. The personal counselors will be instructed to provide tailored feedback on progress and process using positive reinforcement, paraphrasing, and motivational interviewing techniques (e.g., “I read that you have invested quite some time in the recommended exercises of this week.”; “Could it be helpful for you to practice this exercise more regularly?”; “What have you discovered when you performed the exercises?”). Specifically, counselors will use positive reinforcement for signs of awareness, insights, improvement and change (e.g., “This seems a valuable experience for you, how exactly did you achieve that?”; “What will be a next sign of progress?”; “That seems like a helpful thought to me.”). When there are reasons to assume that a participant has serious complaints, the participant will be referred to a general practitioner or a health care specialist. In an attempt to reduce intervention dropout, reminders will be sent to participants who do not send an email to their counselor. The first 2 reminders will be sent by the personal counselor, followed by up to 3 additional reminders sent by the researcher (MS). If a participant has completed more than 3 modules of the book, he or she will only receive reminders from their personal counselor.

A final email with overall feedback on the process of the participant will be sent to all participants who complete at least 3 modules. This final email will be sent when the participant has completed all modules (between 8 and 12 weeks), when the maximum of 3 reminders has been reached by the personal counselor, or when participants are in week 12 of the study without completing all modules.

Email with information

The TL-I group will receive a weekly email from the investigator that contains additional information about the self-help book or the study. A frequently-asked-questions (FAQs) format will be used for this email (e.g., “Q: How can I find the time to practice the recommended exercises?” “A: Select a good moment in your daytime routine, so that practicing the exercises can become a habit. For example, during lunch time, directly after work or half an hour before bed time.”). The information emails will be a work-in-progress during the study because FAQs by participants in the TL-E group will also be integrated into the information emails. Participants will be instructed to read the weekly emails and not to respond to the investigator.

Control group

Participants in the control group will be on a waiting list for the first 6 months of the study and will receive the self-help book after they complete the 6-month follow-up assessment. For the sake of comparison at the long-term follow-up, the control group will also receive the information emails in the same way provided in the TL-I group.

Measures

For a brief overview of all outcome measures and assessment times, see Table 2. Because one of our aims is to examine the working mechanisms underlying the intervention, which requires assessing all included positive psychology components, measures are selected on brevity and availability in the Dutch language.

Primary outcome

Well-being is the primary outcome of this study, measured with the 14-item MHC-SF and the 8-item Flourishing Scale (FS). The items of the MHC-SF can be divided into 3 subscales: emotional well-being (3 items), social well-being (5 items), and psychological

well-being (6 items). All items can be answered on a 6-point answer scale from 0 (*never*) to 5 (*almost always*). A mean score will be computed separately for the total scale and the three subscales. The MHC-SF has excellent psychometric properties (Keyes et al., 2008; Lamers et al., 2011). The FS measures social-psychological well-being with 8 positively formulated items. Participants rate the items on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Total summed scores can range from 8-56. The FS has demonstrated good internal consistency and construct validity (Diener et al., 2009).

Secondary outcomes

The MHC-SF is also used to measure the amount of flourishing (Keyes, 2006; Keyes et al., 2008). Flourishers score 4 or 5 on one or more items on the emotional well-being subscale in combination with a score of 4 or 5 on six of the 11 remaining items. Languishers are those with scores of 0 or 1 on these subscales, and individuals who are neither flourishing nor languishing are labelled as moderately mentally healthy.

Depressive and anxiety symptoms will be measured with the HADS (Zigmond & Snaith, 1983). Each subscale consists of 7 items, 14 items in total. Answer categories differ per item, but all items have 4 answer categories with scores ranging from 0-3. Item scores are summed into a total scale score for anxiety (range 0-21) and depression (range 0-21). The HADS is a widely validated instrument and can be used as a screening instrument in different populations (Bjelland, Dahl, Haug, & Neckelmann, 2002; Spinhoven et al., 1997). A cut-off score of above 10 on each subscale is generally used to identify individuals with at least mild depressive or anxiety symptomatology (Bjelland et al., 2002; Zigmond & Snaith, 1983).

Positive and negative emotional states will be assessed with the modified Differential Emotions Scale (m-DES), which measures 8 groups of positive emotions and 8 groups of negative emotions on a 7-point scale (1 = *not at all*, 7 = *very intense*). Total mean scores will be computed. Although the DES is validated and widely used, the m-DES has not yet been validated (Schaefer, Nils, Sanchez, & Philippot, 2010).

The Strength Use Scale (SUS) is a 14-item scale to assess participants' use of their strengths in a variety of settings (Govindji & Linley, 2007). Scores range from 1 (*strongly disagree*) to 7 (*strongly agree*) with a total summed score of 14 to 98. The SUS possesses high internal consistency and long-term stability (Wood, Linley, Maltby, Kashdan, & Hurling, 2011).

Table 2. Intended questionnaires and assessment times.

Questionnaire	Measurement	Screening	T0 Pre- test	T1 Post- test	T2 Follow- up ^a	T3 Follow- up ^b
MHC-SF	Well-being/ flourishing	X	X	X	X	X
FS	Social-psychological well-being		X	X	X	X
HADS	Symptoms of depression and anxiety	X			X	X
m-DES	Positive and negative emotions		X	X	X	X ^d
SUS	Use of strengths		X	X	X	X ^d
LOT-R	Optimism		X	X	X	X ^d
SCS-SF	Self-compassion		X	X	X	X ^d
BRS	Resilience		X	X	X	X ^d
SPR	Positive relations		X	X	X	X ^d
EPQ-RSS	Extraversion and neuroticism		X			
NEO-FFI	Conscientiousness		X			
MCQ	Direct medical consumption costs		X	X ^c	X ^c	X
PCQ	Non-medical productivity costs		X			X
Brugha Life-events	Positive and negative life-events		X	X	X	X
CSQ-8	Client satisfaction			X ^d		
Process evaluation	Invested time, adherence, positive changes			X ^d		X ^e
	Level of (continued) use					X
Socio-demographics	Gender, age, education, marital status, living situation, ethnicity, daily activities	X				

^a 6 months after T0.^b 12 months after T0.^c Only medical health care costs are assessed, not medication costs.^d Only assessed in the experimental groups, not the control group.^e Only assessed in the control group, not the experimental groups.

Optimism will be assessed with the 10-item Life Orientation Test-Revised (LOT-R) (Scheier, Carver, & Bridges, 1994; Ten Klooster et al., 2010). Items are rated on a 5-point scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*) and indicate participants' evaluation of positive expectations about the future. There are 4 filler items which are excluded from analysis. Scores on the 6 items are summed into a total optimism score ranging from 0-24. The LOT-R has shown predictive and discriminant validity (Scheier et al., 1994).

Self-compassion will be assessed with the Self-Compassion Scale-Short Form (SCS-SF), which consists of 12 items. Participants rate the items on a 7-point scale ranging from 1 (*rarely or never*) to 7 (*almost always*) with a total summed score ranging from 12-84. The SCS-SF has proven to be a valid equivalent of the long-form version (Raes, Pommier, Neff, & Gucht, 2011) developed by Neff (Neff, 2003b).

The 6-item Brief Resilience Scale (BRS) (Smith et al., 2008) will be used to evaluate the level of resilience, which is the ability to bounce back and cope with stress or negative life-events. Items are rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*) with total mean scores ranging from 1 to 5. The psychometric properties are good (Smith et al., 2008).

Although positive relations will be assessed with 1 item of Ryff's scales of psychological well-being (Ryff, 1989) in the MHC-SF, we will also measure the original Subscale of Positive Relations (SPR) as proposed by Ryff (Ryff, 1989). This subscale contains 9 items and a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*) (van Dierendonck, 2011) and a total summed score that range of 9-54.

Tertiary outcomes

The personality traits extraversion and neuroticism will be assessed with the Eysenck Personality Questionnaire-Revised Short Scale (EPQ-RSS) (Eysenck, Eysenck, & Barrett, 1985; Eysenck, White, & Eysenck, 1976; Sanderman, Arrindell, Ranchor, Eysenck, & Eysenck, 1995) and conscientiousness with the NEO Five Factor Inventory (NEO-FFI) (Costa & McCrae, 1995). These personality surveys are widely used and validated. Direct medical and non-medical costs will be measured with the Dutch Medical Consumption Questionnaire (MCQ) (Bouwman et al., 2013a) and 5 items from the Productivity Cost Questionnaire (PCQ) (Bouwman et al., 2013b). Other variables that will be assessed are positive and negative life-events with a scale based on the Brugha Life-events section

(Brugha, Bebbington, Tennant, & Hurry, 1985), and the socio-demographics of gender, age, educational, marital status, living situation, ethnicity, and daily activities.

Process outcomes

The Client Satisfaction Questionnaire-short form (CSQ-8) (Attkisson & Zwick, 1982; de Brey, 1983) will be used to determine overall satisfaction. Additional questions will be asked about time spent with the intervention and self-help book modules, adherence to each module, and significant positive changes since they started with the intervention. The latter question is based on the Client Change Interview Protocol (2014). All email correspondence between participants and personal counselors will be retrieved and saved for content analysis.

Sample size

Well-being is the primary outcome used for the power calculation. We expect to detect a significant effect on well-being between the experimental groups TL-E and TL-I compared to the WL group. Based on recent meta-analyses (Bolier et al., 2013b; Sin & Lyubomirsky, 2009) and a previous comparable study (Fledderus et al., 2012), we expect to find a standardized effect size on well-being of .40 or larger. The targeted sample size is 99 participants per group (297 in total) to provide a statistical power of $(1 - \beta) = 80\%$ and a 5% significance level (two-tailed). To allow a study dropout rate of 25%, we need 132 participants in each condition and 396 participants in total for the trial.

Statistical analyses

The Consolidated Standards of Reporting Trials (CONSORT) statement (Moher et al., 2010) will be used to report the results. Independent t tests and Chi-square statistics (X^2) will be used to examine baseline differences between the study groups. Non-significant socio-demographic differences at baseline will indicate successful randomization. Internal consistency of the constructs will be determined using Cronbach's alpha. To examine the efficacy of the intervention, intention-to-treat analyses will be conducted by including all participants in the analyses who have been randomized. The Expectation Maximization (EM) method will be used to impute all missing data on the continuous measures of T1, T2 and T3. This method imputes the data by maximum likelihood estimation using the observed data in an iterative process (Dempster, Laird, & Rubin, 1977). The intention-to-treat analysis will be compared with a completers-only analysis.

To examine significant differences between the 3 groups, we will perform repeated measures ANOVA in a 3 (group) x 3 (time) design with well-being (MHC-SF and FS) as the primary dependent variable and positive/negative emotions (mDES), the use of strengths (SUS), optimism (LOT-R), self-compassion (SCS-SF), resilience (BRS), and positive relations with others (SPR) as the secondary dependent variables. Significant time x group interactions will be tested with Tukey' post hoc tests. Within-group effects (Cohen's *d*) will be calculated by subtracting the mean post-test or follow-up score from the mean baseline score and dividing the difference by the pooled standard deviation. Between-group effects (Cohen's *d*) will be calculated by subtracting the mean post-test or follow-up score of the experimental group from the mean post-test or follow-up score of the control group, and dividing the difference by the pooled standard deviation (Cohen, 1988). These effect sizes are used to gain insight into the relevance of the significant effects. To examine changes in the amount of flourishers, languishers, and moderately mentally healthy (MHC-SF), descriptive statistics will be used. Changes in categories will be tested with χ^2 -statistics.

Mediator and moderator analyses will be performed as described by Hayes (Hayes, 2009; Hayes, 2012). Mediator analyses will be conducted to investigate which of the specific components of the intervention—positive emotion, use of strengths, optimism, self-compassion, resilience, and positive relations—contribute to its efficacy and mediate overall well-being. Moderator analyses will be conducted to examine which specific subgroups will improve most (or least) on well-being and flourishing from participation in one of the experimental groups. The independent variables of gender, educational level, life-events, personality traits, level of adherence to the intervention, and participation satisfaction will be entered as moderators in regression analyses.

A cost-effectiveness analysis will be conducted from a societal perspective. For each condition, the mean annual health care costs (MCQ), costs due to productivity losses (PCQ), and intervention costs will be calculated on an annual per capita basis for the reference year 2014. All costs will be expressed in Euro (€). The incremental cost-effectiveness ratio (ICER) will be calculated using a bootstrap approach. Then, a cost-effectiveness acceptability curve will demonstrate the probability of the cost-effectiveness of TL-E and TL-I compared to WL, for a range of willingness-to-pay (WTP) ceilings. All tests will be two-sided and will use alphas of .05. All data-analyses will be performed with SPSS version 21.0 or higher.

Results

The data collection will be completed in June 2015.

Discussion

This study will investigate the short- and long-term efficacy of a multicomponent PPI (i.e., self-help book with tailored email support) on well-being and flourishing. Mediator and moderator analyses will be conducted to explore which theoretically relevant hedonic well-being and eudaimonic well-being components included in the self-help book appear to contribute to its efficacy, and who will benefit most from the intervention. The study will be conducted in The Netherlands in a sample with low or moderate levels of well-being without moderate or severe clinical symptomatology. The results from this study will contribute to the knowledge of evidence-based PPIs, in particular multicomponent PPIs, and will be valuable for public mental health services and governments who are increasingly interested in enhancing well-being in the general population (*Foresight mental capital and well-being project. Final project report - executive summary*, 2008; Van Campen, Bergsma, Boelhouwer, Boerefijn, & Bolier, 2012).

There could be several limitations that need to be considered in advance. First, our results might not be generalizable to the general Dutch population, since we will use a self-selected sample and apply exclusion criteria on the level of well-being and clinical symptomatology. It is not unlikely that our open recruitment with advertisement in national newspapers will attract mostly highly-educated women. However, we will use a randomization procedure stratified by gender and education, which will create equal distribution of these characteristics to each group and therefore not harm the internal validity of our study. Second, non-adherence to the intervention and drop out from assessments (incomplete data) could occur. Both types of attrition are closely related and may bias our results (Eysenbach, 2005). Reasons for non-adherence and dropout could be related to individual characteristics (i.e., low-educated individuals might find the intervention and/or assessments too difficult), characteristics of the intervention (i.e., individuals in the experimental conditions receive the self-help book after baseline and are unaware of the content of the book and type of exercises when they apply for the study), and characteristics of the study (i.e., participants will be given instructions and a time schedule) (Eysenbach, 2005). To gain insight on adherence in our study, participants will be asked about time spent on each module, and the personal counselors will gather reasons for non-adherence mentioned in the email correspondence. Although we expect

to find higher adherence rates for individuals in the TL-E condition than has previously been found for Web-based multicomponent PPIs (Bolier et al., 2012; Mitchell et al., 2010; Schueller & Parks, 2012), it could be lower than in face-to-face multicomponent PPIs (Fava & Tomba, 2009; Page & Vella-Brodrick, 2012; Rashid, 2014). However, our study can only draw conclusions about the comparison of the self-help book with email support to the self-help book without email support. Differences in adherence and efficacy between face-to-face support, email support, and no support warrant attention in future research. Furthermore, to prevent low power due to drop out, we have taken into account an attrition rate of 25% in our power analysis. We will also conduct dropout analysis to identify any selectiveness or characteristics of attrition that may be relevant for real-life implementation of the intervention. Third, the use of senior positive psychology students for the email support can be a risk for the professionalism of our intervention because these students are unexperienced psychologists. We will try to reduce this risk by providing extensive supervision from experienced psychologists and by only selecting students who are thoroughly trained in email support and who have practiced the self-help book. On the other hand, the guidance is primarily process-oriented and advanced clinical counseling skills are therefore not considered necessary. The benefit of using students as counselors is that the intervention costs will be very low. If proven effective, it could be even more effective when implemented in a mental health service with experienced and professional counselors, although this could be disadvantageous for its cost-effectivity. Nevertheless, this needs to be tested in future research.

Our study will be the first to investigate the efficacy and working mechanisms of a theory- and research-based multicomponent PPI in the form of a self-help book with email support to enhance well-being and flourishing in the general population. Our study will add to the existing knowledge in that we (1) focus on well-being and flourishing instead of mental illness, (2) use a multicomponent intervention instead of a single-component intervention, (3) integrate some advantages of face-to-face multicomponent PPIs with Web-based multicomponent PPIs by using a self-help book with asynchronous and tailored email support, (4) examine the intervention in a population with low or moderate levels of well-being without moderate or severe clinical symptomatology instead of a population with at least moderate clinical symptomatology without any criteria on the well-being dimension of the two-continua model of mental health, and (5) measure and analyze each specific well-being component that is included in the self-help book: positive emotion, use of strengths, optimism, self-compassion, resilience, and positive relations. Taken together, our results will contribute to a new

field of multicomponent PPIs for enhancing well-being and flourishing in the general population and highlight a new target population for mental health promotion. If proven effective, our results can be specifically of interest for public mental health and primary care because these health care fields are expanding, while specialist mental health care is diminishing, at least in The Netherlands.

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Chapter 5

Validation of the Flourishing Scale in a Sample of People with Suboptimal Levels of Mental Well-being

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Abstract

Background. There is growing interest in measuring the eudaimonic perspective of mental well-being (social and psychological well-being) alongside existing measures of the hedonic perspective of mental well-being (subjective well-being). The Flourishing Scale (FS) assesses core aspects of social-psychological functioning and is now widely used in research in practice. However, the reliability and validity of eudaimonic measures such as the FS has not yet been tested in people with low or moderate levels of well-being. This group is at risk for developing mental disorders and, therefore, an important target group for public mental health.

Methods. We extensively evaluated the psychometric properties of the 8-item FS in a sample of adults with low or moderate levels of well-being in The Netherlands (N = 275) using confirmatory factor analysis (CFA), item response theory analysis and a multitrait matrix.

Results. The unidimensional structure of the scale was confirmed with CFA and an adequate fit to the Rasch model. However, our sample showed positive skewness of the scale, but lacked measurement precision at the higher end of the social-psychological continuum. In general, the multitrait matrix demonstrated the convergent validity of the scale, with strong to weak correlations between the FS and (1) overall well-being, (2) social and psychological well-being (3) positive eudaimonic states, (4) hedonic states, (5) psychopathology and (6) personality traits. Nevertheless, relatively low correlations were found, specifically in comparison with the Mental Health Continuum-Short Form (MHC-SF).

Conclusions. The FS seems a reliable and valid instrument for measuring social-psychological functioning in adults with suboptimal well-being, but its use in intervention studies and clinical practice might be debatable. Therefore, the FS seems most suitable to include in epidemiological studies alongside existing hedonic measures to more fully capture mental well-being. Future research should examine the temporal stability of the FS and the consequences of the positive skewness and limited external validity of the scale found in the current study.

Introduction

Mental well-being is an important multifaceted construct with an extensive and long-standing history in the scientific literature. Mental well-being captures both the hedonic and eudaimonic perspectives on well-being. Whereas the hedonic perspective refers to the affective or “feeling good” dimension of well-being (i.e. happiness, life-satisfaction and positive affect) (Diener, 1984) the eudaimonic perspective refers to the psychological functioning or “living well” dimension of well-being (e.g. social contribution, positive relationships with others and personal growth) (Keyes, 1998; Ryff, 1989). Traditionally, most (socioeconomic) research has been conducted on the hedonic perspective with the use of single-item or brief subjective well-being measures such as the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999) and the Positive and Negative Affectivity Scale (Watson, Clark, & Tellegen, 1988). While these measures are firmly rooted in research and practice, the availability and use of measures to capture the social and psychological well-being dimensions lags behind.

A few decades ago, researchers started to unravel the core aspects of the eudaimonic perspective. Ryff (Ryff, 1989) defined six core dimensions of psychological well-being (self-acceptance, purpose in life, environmental mastery, positive relationships, personal growth and autonomy), based on an extensive review of humanistic, existential and developmental theories. Keyes (Keyes, 1998) identified five core dimensions of social well-being (social acceptance, social actualization, social contribution, social coherence and social integration) originating from sociological and social psychological theories. These social and psychological core aspects of well-being are united in the comprehensive Mental Health Continuum-Short Form (MHC-SF) which also measures hedonic (subjective) well-being (Keyes, 2005; Keyes et al., 2008). There are a few other comprehensive generic well-being instruments available, such as the WHO Five Well-being Index (Bech, 1999) and the Warwick-Edinburgh Mental Well-being Scale (Tennant et al., 2007). However, in order to complement existing measures of the hedonic perspective, for example in epidemiological and socioeconomic research, there is also a need for instruments assessing only the core dimensions of the eudaimonic perspective. Therefore, Diener et al. (Diener et al., 2009b) have recently developed the brief and comprehensive Flourishing Scale (FS) based on humanistic and eudaimonic well-being theories.

Today, the FS is widely used in well-being intervention studies and clinical practice, probably due to its brevity, simplicity and comprehensiveness. The FS has already been translated into 17 languages and measures the core aspects of social-psychological functioning, namely purpose and meaning, supportive relationships, engagement, contribution to the well-being of others, competence, self-acceptance, optimism, and being respected. The growing popularity of the FS might also be a consequence of its attractive name, suggesting that the scale measures “flourishing”. However, most researchers have defined flourishing as a state where *high levels of subjective well-being* and *high levels of social-psychological well-being* are achieved (Hone, Jarden, Schofield, & Duncan, 2014; Keyes, 2002; Seligman, 2011). As such, the scale’s name may be somewhat confusing because it only measures social-psychological well-being and lacks a clear cut-off for having high levels of social-psychological well-being. Regarding the development of the scale, its first version was labeled the Psychological Flourishing Scale and contained 12 items (Diener & Biswas-Diener, 2008). The revised and final version of the scale has eight items and was called the Psychological Well-being scale (Diener et al., 2009a). Since this name was so similar to Ryff’s Scales of Psychological Well-being (Ryff, 1989), the authors re-named their scale to the FS (Diener et al., 2009b).

Acceptable psychometric properties of the FS have been found in student samples (Diener et al., 2009b; Howell & Buro, 2014; Sumi, 2013), a full-time employee sample (Silva & Caetano, 2011), a community sample (Tang, Duan, Wang, & Liu, 2014) and in a national representative population sample (Hone, Jarden, & Schofield, 2013). All these studies found a single factor structure using exploratory or confirmatory factor analysis (EFA and CFA), and adequate to excellent reliability with Cronbach’s alpha values ranging from .78 to .95. Most previous validation studies also supported the convergent validity of the FS. For example, moderate to strong positive correlations were found for overall psychological well-being (i.e. Ryff’s Scales of Psychological Well-being and the Basic Needs Satisfaction Scale) and moderate to strong negative correlations were found for depression, anxiety and stress (Diener et al., 2009b; Hone et al., 2013; Sumi, 2013). Yet, the convergent validity of the FS has mostly been supported by measures of subjective well-being (i.e. happiness, life-satisfaction and positive emotions) only (Diener et al., 2009b; Hone et al., 2013; Silva & Caetano, 2011; Sumi, 2013). Since the FS measures core aspects of optimal social-psychological functioning, more information is needed about how each of these core aspects (such as competence, self-compassion and positive relationships) are related to the FS. In addition, the relationship between eudaimonic well-being and personality traits has hardly been investigated, although there are some indications that weak correlations can be expected. For example, Lamers

and colleagues (Lamers, Westerhof, Kovács, & Bohlmeijer, 2012) found weak positive correlations between subjective, psychological and social well-being on the one hand and emotional stability (opposite of neuroticism), extraversion and conscientiousness on the other.

The current study adds to the psychometric validation of the FS in several ways. First, we evaluated the internal and external construct validity of the FS in a sample of adults with low or moderate levels of well-being which seems an important target group for public mental health and well-being intervention studies because low to moderate well-being increases the risk of developing mental illness (Grant, Guille, & Sen, 2013; Keyes, Dhingra, & Simoes, 2010; Lamers, Westerhof, Glas, & Bohlmeijer, 2015; Wood & Joseph, 2010). Second, we used item response theory (IRT) analyses to further demonstrate the unidimensionality of the FS and explore its local reliability (measurement precision) along the underlying continuum. Third, we further unraveled the convergent validity of the FS using a multitrait matrix. With respect to convergent validity, we expected to find the following gradual pattern of stronger to weaker relationships with (1) overall well-being, (2) social and psychological well-being, (3) positive eudaimonic states (i.e. the use of strengths/competence, optimism, self-compassion, resilience and positive relationships), (4) hedonic states (i.e. emotional well-being, positive and negative emotions), (5) psychopathology (i.e. anxiety, depression) and (6) personality traits (i.e. extraversion, neuroticism, conscientiousness).

Method

Participants

We used data from the baseline measurement of a randomized controlled trial in The Netherlands that evaluated the efficacy of a multicomponent positive psychology intervention (Schootanus-Dijkstra, Drossaert, Pieterse, Walburg, & Bohlmeijer, 2015). Participants with low or moderate levels of well-being were recruited in January 2014 by advertisements in national newspapers and in an online newsletter of a popular psychology magazine. In total, 275 participants were included, gave informed consent and completed the online survey at baseline. Mean age was 47.8 years ($SD = 10.9$) with a range from 20 to 67 years. Participants were mainly female (85.8%), higher educated (74.6%) and in paid employment (67.6%) (Table 1). While we had excluded individuals with flourishing mental health (i.e. high levels of both hedonic and eudaimonic well-being) two weeks prior to baseline, at baseline there were 21 (7.6%) respondents who met

the classification criteria for flourishing as measured with the MHC-SF (Keyes et al., 2008).

Table 1. Demographic characteristics of the study sample (N = 275).

Characteristic	Mean ± SD or number (%)
Age, years	47.78 ± 10.88
Gender, female	236 (85.8%)
Education	
Low	10 (3.7%)
Middle	59 (21.7%)
High	203 (74.6%)
Marital status	
Married / Registered	118 (42.9%)
Divorced / Widow	70 (25.5%)
Never been married	87 (31.6%)
Living situation	
With partner and children	78 (28.4%)
With partner without children	76 (27.6%)
Alone	76 (27.6%)
With others	45 (16.4%)
Daily activities	
Paid employment	186 (67.6%)
Unemployed / Unable to work	58 (21.1%)
Other	31 (11.2%)

Note. SD = standard deviation.

Measures

The FS (Diener et al., 2009b) consists of eight items, each measuring a core aspect of optimal social-psychological functioning on a 7-point Likert scale that ranges from 1 (Strongly disagree) to 7 (Strongly agree). For this study, the original English version of the FS was independently translated into Dutch by two bilingual native Dutch speakers (authors PMK and ETB). Both translations were compared and inter-translator differences were carefully discussed before consensus was reached. The Dutch version was used in the current study. All other measures were also administered in Dutch.

The MHC-SF (Keyes et al., 2008; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011) consists of 14 items which are divided into the three subscales “emotional well-being” (three items), “social well-being” (five items), and “psychological well-being” (six items). In addition, the scores on all 14 items can be averaged into a total well-being score. Items are answered on a 6-point scale ranging from 0 (never) to 5 (almost always or always).

The Strength Use Scale (SUS) measures the level of competence in different settings with 14 items. Each item is answered on a 6-point scale that ranges from 1 (Strongly disagree) to 7 (Strongly agree) (Govindji & Linley, 2007).

The Life Orientation Test-Revised (LOT-R) consists of 10 items that assess dispositional optimism versus pessimism (Ten Klooster et al., 2010). Four filler items were excluded from this analysis and of the remaining six, three items measure optimism and three measure pessimism. The items are answered on a 5-point scale with a range from 0 (Strongly disagree) to 4 (Strongly agree). A total score was obtained for a more optimistic expectation about the future.

The Self-Compassion Scale-Short Form (SCS-SF) is a 12-item measurement used to assess the level of self-compassion on a 7-point scale that ranges from 1 (Rarely or never) to 7 (Almost always) (Raes, Pommier, Neff, & Van Gucht, 2011).

The Brief Resilience Scale (BRS) is a 6-item inventory that assesses the ability to bounce back and to cope with stress or negative life-events (Smith et al., 2008). Answers are given on a 5-point scale that ranges from 1 (Strongly disagree) to 5 (Strongly agree).

Ryff's Subscale of Positive Relationships (SPR) is a subscale of Ryff's Scales of Psychological Well-being (Ryff, 1989). The SPR has 9 items and a 6-point answer scale that ranges from 1 (Strongly disagree) to 6 (Strongly agree) (van Dierendonck, 2011).

Positive and negative emotions were assessed with the modified Differential Emotions Scale (mDES), which measures the frequency of eight groups of positive emotions and feelings and eight groups of negative emotions and feelings, with answer categories on a 7-point scale that ranges from 1 (Not at all) to 7 (Very intense) (Schaefer, Nils, Sanchez, & Philippot, 2010).

Depression and anxiety symptoms were measured with the Hospital Anxiety and Depression Scale (HADS), an inventory with two subscales that assess the frequency of anxiety symptoms (seven items) and depression symptoms (seven items) (Spinhoven et al., 1997). Answer categories differ for each item, but all items are answered on a 4-point scale (0-3). This questionnaire was administered at screening, around two weeks before the baseline measurement. Participants with a score above 10 on one or both subscales were excluded from the randomized controlled trial and, therefore, also from the current study.

In accordance with the national representative Netherlands Mental Health Survey and Incidence Study-2 (de Graaf, ten Have, & van Dorsselaer, 2010), we measured the personality traits extraversion and neuroticism with the Eysenck Personality Questionnaire-Revised Short Scale (EPQ-RS) (Sanderman, Arrindell, Ranchor, Eysenck, & Eysenck, 1995) and conscientiousness with the 12-item NEO Five Factor Inventory (NEO-FFI) (Costa & McCrae, 1995). Extraversion and neuroticism were each measured with 12 items answered with yes (1) or no (0). The NEO-FFI has a 5-point scale that ranges from 1 (Strongly disagree) to 5 (Strongly agree).

Statistical analyses

Descriptive and distributional statistics of the FS total scores were determined by the identification of possible skewness, kurtosis, and floor and ceiling effects. Skewness and kurtosis values between -1 and +1 were considered indicative of normality, and floor and ceiling effects were considered present when more than 15% of the participants scored the lowest (8) or highest possible score (56) (Terwee et al., 2007). There were no missing values on any of the measures used in this study.

Given the ordinal nature of the items, the unidimensionality of the FS was examined using robust maximum likelihood CFA with Satorra-Bentler (SB) scaled statistics. With the use of LISREL version 8.80 (Scientific Software International, Lincolnwood, IL), a one-factor model was fit to the data. We did not allow error covariances between items (i.e. shared item variance) because each item corresponds to one core aspect of social-psychological functioning which are theoretically distinct. Indicators of a good model fit were a non-normed fit index (NNFI) and comparative fit index (CFI) $\geq .95$, standardized root mean square residual (SRMS) $\leq .08$, and root mean square error of approximation (RMSEA) $\leq .06$ (Browne & Cudeck, 1993; Hu & Bentler, 1999). The internal consistency of the FS was examined with Cronbach's alpha, with a value $\geq .70$ considered adequate for group-level analyses (Lohr, 2002).

To further determine the internal construct validity of the FS, we performed Rasch partial credit model analyses in Winsteps version 3.65 (Winsteps, Chicago, IL). The Rasch partial credit model is an extension of the original dichotomous Rasch model specifically designed for ordinal scales. Fit to the Rasch model provides further evidence of unidimensionality, but also allows the investigation of a scale's local measurement precision. Regarding the former, indicators of acceptable item fit were mean square infit (information-weighted fit statistic) and outfit (outlier sensitive fit statistic) values between .70 and 1.30 (Wright, Linacre, Gustafson, & Martin-Lof, 1994). The infit statistic is sensitive to outliers on those items that are close to the abilities of a person, and the outfit statistic is sensitive to outliers on all items independent from the person's level of well-being (Tennant & Conaghan, 2007). Also, a test information curve was obtained for examining the local measurement precision of the scale along the latent social-psychological well-being continuum. Overall reliability was examined with the person reliability measure, which is the Rasch-based version of Cronbach's alpha. Rasch person reliability is the proportion of observed variance that is free from measurement error. In practice, values around .80 are considered acceptable (Linacre, 2006).

The external construct validity of the FS was examined with a wide variety of measures as detailed above. Pearson correlation coefficients were used to evaluate the convergent validity as a gradual pattern of decreasing correlations with an expected strongest relation between FS and MHC-SF and an expected weakest relation between FS and personality traits. Bivariate correlations were obtained using SPSS version 21.0 (IBM, Chicago, IL)

Results

Descriptive analysis

The mean total score on the FS was 41.4 [Standard deviation (SD) = 6.5] with a range from 13 to 53. Mean scores on the individual items ranged from 4.7 to 5.5, on a scale of 1 to 7. Figure 1 shows the distribution of the total scores on the FS, which were skewed towards higher scores on optimal social-psychological functioning (Kolmogorov-Smirnov, $p < .001$), with a skewness value of -1.46 and a kurtosis value of 2.99. There were no floor or ceiling effects since no participants scored either 8 or 56. These descriptive and distribution statistics suggest that the majority of our sample perceived themselves positively on the main aspects of social-psychological functioning.

Figure 1. Distribution of total scores of the Flourishing Scale.

Internal construct validity

Results of the CFA revealed good fit indices for a one-factor model, supporting the unidimensional structure of the FS. All indices were within the recommended range for good fit: SB χ^2 (20) = 39.59, NNFI = .98, CFI = .99, SRMR = .05, RMSEA (90% CI) = .06 (.03 – .09). Figure 2 shows the standardized factor loadings and the item residuals. Factor loadings ranged between .53 for item 2 and .76 for item 1. Additionally, the FS showed good internal consistency with a Cronbach alpha coefficient of .86.

Figure 2. Standardized factor loadings and residuals for the eight items of the Flourishing Scale.

The unidimensionality of the scale was further confirmed by an adequate fit to the Rasch model. Most items performed within the range of good fit (.7 – 1.3), except for minor misfit of the infit and outfit values for item 2 and the outfit value for item 5 (Table 2). The item difficulty in logits shows that item 1 was the most difficult to endorse (1.01 logits) and item 8 was the easiest to endorse (-.65). The Rasch person reliability was .79, indicating adequate reliability for group-level comparisons. However, the test information curve (Figure 3) showed that the scale had adequate measurement precision across a rather limited range of the continuum with a clear peak at relatively lower to moderate levels of well-being ($r > .70$). Logits of this peak were between -2.7 and 1.2 and correspond to approximate total sum scores on the FS between 16 and 43. In other words, the level of optimal well-being in our sample was measured most accurately in individuals with average or below average levels of social-psychological functioning. The assessment in individuals with high levels of social-psychological functioning was less accurate.

Table 2. Rasch item parameters (partial credit model) and fit statistics of the Flourishing Scale.

	Item difficulty	Infit MNSQ	Outfit MNSQ
	in logits (SE)		
1. I lead a purposeful and meaningful life	1.01 (.07)	.81	.86
2. My social relationships are supportive and rewarding	-.24 (.07)	1.35	1.34
3. I am engaged and interested in my daily activities	.08 (.08)	.89	.87
4. I actively contribute to the happiness and well-being of others	-.30 (.08)	.98	.95
5. I am competent and capable in the activities that are important to me	.21 (.08)	1.08	1.47
6. I am a good person and live a good life	-.47 (.08)	.93	.88
7. I am optimistic about my future	.35 (.07)	1.05	1.01
8. People respect me	-.65 (.09)	.84	.78

Note. Higher positive logit scores indicate more difficult items. SE = standard error; MNSQ = mean square.

Figure 3. Test information curve of the Flourishing Scale (FS) in relation to the Rasch score. Higher positive logit scores indicate higher social-psychological functioning. Test information values of 3.33 and 10 (dashed lines) correspond to a reliability of .70 and .90, respectively. Logit values of -7, -3, 0, 1, and 7 correspond to approximate total sum scores on the FS of 11, 16, 38, 43, and 55 respectively.

External construct validity

Table 3 shows that the FS correlated most strongly with the MHC-SF ($r = .58$), followed by its subscales for social and psychological well-being ($r = .50 - .58$). The FS also showed a strong correlation with use of strengths ($r = .55$). Moderate to strong correlations were found for most other positive eudaimonic states ($r = .35$ to $.46$) and for the relation between the FS and emotional well-being ($r = .40$). We found weak to moderate correlations for other indicators of hedonic states ($r = .15$ and $-.19$), for psychopathology ($r = -.17$ and $-.34$) and for personality traits ($r = .23$ to $.32$). Contrary to our expectations, the weakest correlations with the FS were found for positive emotions, negative emotions, anxiety symptoms and resilience ($r = .15$ to $-.19$), and not for personality traits. All correlations with the FS were statistically significant ($p < .01$) and in the expected direction.

Table 3. Multitrait matrix of the Flourishing Scale and other measures.

	FS	MHC-SF	SWB	PWB	SUS	SCS-SF	LOT-R	SPR	BRS	EWB	mDES Pos	mDES Neg	HADS -A	HADS -D	Extr	Neu
FS	(.86)															
1. Overall well-being MHC-SF	.58***	(.88)														
2. Social and psychological well-being	.50***	.88***	(.70)													
SWB	.58***	.92***	.68***	(.79)												
3. Positive eudaimonic states	.55***	.58***	.47***	.60***	(.95)											
SUS	.35***	.58***	.48***	.54***	.42***	(.85)										
SCS-SF	.45***	.50***	.42***	.46***	.39***	.46***	(.74)									
LOT-R	.46***	.48***	.44***	.47***	.29***	.30***	.32***	(.82)								
SPR	.16**	.31***	.18**	.33***	.33***	.46***	.36***	.11	(.83)							
4. Hedonic states	.40***	.80***	.56***	.66***	.39***	.48***	.43***	.32***	.31***	(.80)						
EWB	.15*	.22***	.13*	.25***	.19**	.08	.15*	.08	.10	.20**	(.56)					
mDES Pos	.19**	.23***	.19**	.21**	.13*	.20**	.15*	.24***	.13*	.23***	.27***	(.72)				
5. Psychopathology	.17**	.27***	.28***	.22***	.13*	.36***	.24***	.12*	.15**	.22***	.05	.27***	(.76)			
HADS-A	.34***	.49***	.36***	.44***	.27***	.31***	.30***	.28***	.22***	.52***	.27***	.22***	.34***	(.76)		
6. Personality traits	.23***	.29***	.25***	.28***	.36***	.18*	.23***	.34***	.24***	.20**	.09	.11	.05	.13*	(.84)	
Extraversion	.24***	.40***	.31***	.37***	.24***	.55***	.41***	.31***	.53***	.36***	.06	.21***	.39***	.24***	.15*	(.78)
Neuroticism	.32***	.29***	.20**	.33***	.37***	.17**	.18**	.17**	.24***	.20**	.10	.10	.07	.26***	.09	.14*
Conscientiousness																

BRS = Brief Resilience Scale; EWB = Emotional well-being subscale of the MHC-SF; Extr = Extraversion; FS = Flourishing Scale; HADS-A = Hospital Anxiety and Depression Scale-Anxiety Subscale; HADS-D = Hospital Anxiety and Depression Scale-Depression Subscale; LOT-R = Life Orientation Test-Revised (optimism); mDES Neg = modified Differential Emotions Scale, negative emotions; mDES Pos = modified Differential Emotions Scale, positive emotions; MHC-SF = Mental Health Continuum-Short Form; Neu = Neuroticism; PWB = Psychological well-being subscale of the MHC-SF; SCS-SF = Self-compassion Scale-Short Form; SPR = Ryff's Subscale of Positive Relationships; SUS = Strengths Use Scale; SWB = Social well-being subscale of the MHC-SF.

Cronbach's alphas are in parentheses. Coefficients $\geq .50$ are in bold. * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

This is the first study to evaluate the internal and external construct validity of the Flourishing Scale in a sample of 275 adults with suboptimal well-being. Robust CFA and item response theory analysis supported prior findings for the unidimensionality of the scale and demonstrated satisfactory item fit. However, the Rasch results also showed that social-psychological functioning was most adequately measured across a rather limited range of its continuum. The convergent validity of the FS was partially supported by our data.

Internal validity

The Rasch analysis demonstrated adequate overall reliability and good item fit for most items. However, there was some misfit for item 2 (i.e. “My social relationships are supportive and rewarding”) and item 5 (i.e. “I am competent and capable in the activities that are important to me”). Misfit values slightly exceeded the boundary of 1.30, suggesting that these items showed more observed variance than was expected in the model. Replications in other samples are needed to determine whether revision of the items is necessary.

An intriguing result concerns the positive skewness of the FS. Despite the fact that we excluded individuals with high levels of well-being (i.e. flourishing mental health) two weeks before the baseline measurement—as measured with the MHC-SF—the total scores on the FS were rather skewed towards higher social-psychological functioning in agreement with prior validation studies. For example, our mean score of 41.4 (SD = 6.5) is only slightly lower than the mean scores found in a general population sample (mean = 43.8, SD = 8.4) (Hone et al., 2013), an employee sample (mean = 42.9, SD = 6.1) (Silva & Caetano, 2011) and different student samples (most means were between 44.5 and 46.7 (Diener et al., 2009b; Howell & Buro, 2014; Silva & Caetano, 2011), except for one study that found a mean score of 36.6 (Sumi, 2013)). Thus, while the MHC-SF and FS both predominantly intend to measure the eudaimonic perspective of well-being, our findings could indicate that both instruments actually measure different aspects of optimal social-psychological functioning. For example, the FS contains items about competence, engagement and optimism while these eudaimonic aspects are not specifically questioned in the MHC-SF (Hone et al., 2014). More research into consequences of the positive skewness of the FS is needed, for instance, by validating the

FS in clinical samples where a more normally-distributed level of social-psychological well-being could be expected.

Moreover, our research also demonstrated that social-psychological functioning was most reliably measured between scores of 16 and 43, scores that correspond to the “very low” and “low” population norm classifications of Diener (Diener). Thus, participants in a variety of samples (including the present sample) tend to score high on the FS, but measurement precision in the present sample showed that high social-psychological functioning was less adequately measured. Therefore, our results suggest that the FS may benefit from more differentiation in the difficulty of the items by including items that are indicative for higher levels of well-being or items that can better discriminate between the moderate and high end of the social-psychological continuum. Measurement precision across a broader range of the continuum is especially important when researchers want to examine individual changes in well-being scores and the transition from low or moderate well-being to high well-being, which is often the main aim in well-being intervention studies. Overall, the operationalization of eudaimonic well-being and its core aspects warrant further investigation, as well as research about adequate cut-off values for “high eudaimonic well-being”. In this regard, it should be recognized that little information is available about the theoretical foundation of the FS (Diener et al., 2009b), especially concerning a solid overarching theory and the rationale for including some eudaimonic concepts whilst ignoring others.

External validity

Regarding convergent validity, our results largely confirmed the hypothesized gradual pattern of descending correlations between the FS and the MHC-SF, positive eudaimonic states, hedonic states, psychopathology, and personality traits respectively. While we found a strong relationship between the FS and MHC-SF, its correlation of $r = .58$ was considerably lower than a priori could be expected. Noteworthy, the MHC-SF showed a similar gradual pattern of correlations from closely to more distant related measures, but with consistently higher correlations compared to the FS. Despite the fact that the MHC-SF showed moderate to strong correlations with depression and neuroticism, these findings suggest that the MHC-SF may have superior convergent validity compared to the FS.

Strikingly, we found lower than expected correlations between the FS and most positive eudaimonic states, such as self-compassion and optimism. An explanation might be that the items of the FS are too broadly phrased which may diffuse their relation with their underlying individual constructs. Another explanation might be that our sample was too homogenous by excluding people with flourishing mental health. However, prior studies also found predominantly moderate to strong correlations with eudaimonic well-being measures of which the highest correlations were only around .70 for some subscales of Ryff's Scales of Psychological Well-being and the "competency" subscale of the Basic Needs Satisfaction Scale (Diener et al., 2009b).

Furthermore, while the hedonic perspective is not represented in the eight items of the FS, the relationship between the FS and emotional well-being was not much lower than for the observed correlations between the FS and measures of positive eudaimonic states. This result corroborates with the view that hedonic and eudaimonic well-being are distinct but overlapping perspectives of well-being (Huta & Ryan, 2009). However, we found lower correlations compared to prior FS validation studies which found moderate or even strong correlations between the FS and measures of the hedonic perspective (Diener et al., 2009b; Hone et al., 2013; Silva & Caetano, 2011; Sumi, 2013), raising again the question how eudaimonic well-being should be operationalized (Huta & Waterman, 2013). In sum, our findings may point to limited external validity of the FS, at least in comparison with the MHC-SF.

Limitations

Our study was limited by the representativeness of the sample. Participants were self-selected adults with low or moderate levels of well-being (without elevated levels of clinical symptomatology) who were motivated to improve their well-being with a positive psychology intervention. Also, female and highly-educated participants were overrepresented. Another limitation of the study was the inability to examine the temporal stability and responsiveness of the FS in our study. The test-retest reliability of the scale has only been examined by Diener and colleagues [8], who used a student sample and a time interval of one month. For the use of the FS in longitudinal and intervention studies, it is essential that future studies establish the stability of the FS and its sensitivity to change. Finally, due to the low Cronbach's alpha of .56 for positive emotions in our sample, its correlational results should be interpreted with some caution.

Conclusion

Researchers, practitioners and governments are increasingly interested in the concept of mental well-being and flourishing, but the majority of epidemiological studies have only included brief subjective well-being measures (typically containing one to five items) alongside economic, social and health indicators [38]. Therefore, it seems important to include the FS as a complementary measure to more fully capture mental well-being in the general population. From a public mental health and societal perspective, it is also important to improve social-psychological functioning because flourishing protects against the development of mental disorders later in life [39-42]. The current study indicates that the FS might be most appropriate for use in epidemiological studies alongside an existing hedonic measure, but its use in well-being intervention studies and clinical practice might be debatable. In particular, we found positive skewness of the FS in a sample of people with suboptimal well-being, the FS lacked measurement precision at higher levels of social-psychological functioning and demonstrated relatively low correlations with overall well-being and positive eudaimonic states. In sum, the Dutch version of the FS appears to be a reliable tool for measuring the core aspects of the eudaimonic perspective in adults with low or moderate levels of well-being, but researchers and practitioners should be aware of its possible limitations as a standalone measure of flourishing.

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Chapter 6

An Early Intervention to Promote Well-being and Flourishing and Reduce Anxiety and Depression: A Randomized Controlled Trial

This chapter is submitted as:

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Abstract

Background: There is growing evidence that an effective strategy for the prevention of mental disorders could be to foster mental well-being and flourishing. In this study, we examined whether a 9-week comprehensive positive self-help intervention with email support (TL-E) was effective in enhancing well-being and flourishing and decreasing anxiety and depressive symptoms in a non-clinical sample.

Methods: 275 participants with low or moderate well-being (mean age = 47 years, 86% female) were randomly assigned to TL-E ($n = 137$) or a wait-list control group (WL; $n = 138$). Participants completed online self-report questionnaires at baseline, 3, 6 and 12 months.

Results: Repeated measures analysis revealed significant more improvement on mental well-being ($d = 0.67$, 95% CI = 0.43 – 0.92), anxiety ($d = 0.63$, 95% CI = 0.38 – 0.87) and depression ($d = 0.42$, 95% CI = 0.18 – 0.66) in the TL-E group versus the WL group, but not on social-psychological functioning ($p = 0.089$). The proportion of flourishing in the TL-E group increased from 7 to 30% after 3 months (NNT = 5.46) and to 34% after 6 months (NNT = 5.25). Within group effects on all outcomes were maintained up to 12 months. We found no meaningful dose-response relationship for adherence, nor a clear moderator pattern.

Limitations: It is unknown whether results were influenced by personal counseling since TL-E was only compared to a wait-list condition. The generalizability of the findings were limited by the self-selected sample of mainly higher educated women.

Conclusions: A guided positive self-help intervention has the potential to improve well-being up to a flourishing mental health status and may thereby reduce the risk for anxiety and depressive disorders in the general population.

Introduction

There is accumulating support for enhancing enduring mental well-being in clinical practice alongside traditional treatments with a focus on alleviating the burden of disease (Duckworth, Steen, & Seligman, 2005; Forsman et al., 2015; Jeste, Palmer, Rettew, & Boardman, 2015; Kobau et al., 2011; Ryff, 2014). Recent evidence shows that higher well-being protects against the incidence of mental disorders such as anxiety and depression (Grant, Guille, & Sen, 2013; Keyes, Dhingra, & Simoes, 2010; Lamers, Westerhof, Glas, & Bohlmeijer, 2015; Wood & Joseph, 2010) and reduces suicide risk (Keyes et al., 2012; Koivumaa-Honkanen, Kaprio, Honkanen, Viinamaki, & Koskenvuo, 2004). There is also compelling evidence that higher well-being increases longevity with several years, in healthy populations and in some somatic illness populations (Chida & Steptoe, 2008; Diener & Chan, 2011; Keyes & Simoes, 2012; Lamers, Bolier, Westerhof, Smit, & Bohlmeijer, 2012; Veenhoven, 2007). In addition, studies have found that low or moderate well-being has substantial economic consequences due to productivity losses and healthcare costs (Hamar, Coberley, Pope, & Rula, 2015; Keyes, 2007; Keyes & Grzywacz, 2005). In light of this evidence, the promotion of mental well-being has been prioritized as the number one goal for the public mental health agenda in Europe (Forsman et al., 2015). Moreover, researchers have now underscored the need for broadening the scope of psychiatry with “positive psychiatry”, which is “the science and practice of psychiatry that seeks to understand and promote well-being through assessment and interventions aimed at enhancing behavioral and mental wellness” (Jeste et al., 2015, p. 675).

In this paper, we present results from a study using Keyes’ (2007) classification framework of mental well-being as a systematic approach for implementing early mental health interventions. This classification model was developed in analogy with the classification model of major depression and distinguishes three levels of positive mental health: flourishing, moderate mental health and languishing. Individuals with flourishing mental health score high on emotional, social and psychological well-being, while individuals with languishing mental health score low on each of these dimensions (Keyes, 2007). Most beneficial effects on health, society and economy have been found for flourishing opposed to languishing mental health and also opposed to moderate mental health (Keyes & Simoes, 2012; Keyes et al., 2010; Keyes & Grzywacz, 2005). This implies that enhancing well-being in people with low or moderate well-being could be an effective strategy for the prevention of anxiety and depression.

In order to promote enduring mental well-being and flourishing, a comprehensive intervention based on a positive framework is deemed necessary, targeting multiple well-being components such as positive emotion, optimism and positive relations at the same time (Huta & Ryan, 2009; Kobau et al., 2011; Seligman, 2011). Examples of such interventions are Positive Psychotherapy (Rashid, 2014), Well-being therapy (Fava, 1999; Ruini, Albieri, & Vescovelli, 2014) and the Working for Wellness program (Page & Vella-Brodrick, 2012). However, studies examining the efficacy of these comprehensive interventions did not target people with low or moderate well-being and the interventions were also not systematically evaluated for effects on flourishing. Furthermore, most of these studies suffered from methodological limitations such as a relatively small sample size in group therapies (Page & Vella-Brodrick, 2012; Rashid, 2014; Ruini et al., 2014) or a low adherence rate in (web-based) self-help interventions (Bolier et al., 2013; Mitchell, Vella-Brodrick, & Klein, 2010; Schueller & Parks, 2012). To tackle these deficiencies, a successful approach might be to integrate the main advantage of group therapy—personal counseling—within a self-help program, since self-help programs can reach large target groups. In fact, a positive self-help book based on Acceptance and Commitment Therapy (ACT) and mindfulness has not only found promising results and satisfactory adherence rates for participants who received personal email support (Fledderus, Bohlmeijer, Pieterse, & Schreurs, 2012; Pots et al., 2016), post-hoc analyses revealed that this intervention was also effective in enhancing flourishing (Bohlmeijer, Lamers, & Fledderus, 2015). Yet, this positive self-help program was designed and evaluated for people with depressive symptoms.

The current study evaluated a 9-week multicomponent positive self-help book with email support in individuals with low or moderate well-being who were recruited in the general Dutch population. We conducted a randomized controlled trial (RCT) to evaluate the superiority of the intervention on well-being and flourishing over a wait-list control group. We also examined the efficacy of this early intervention on anxiety and depressive symptoms and tested whether specific subgroups benefited most from the intervention.

Methods

This study was approved by the Ethics Committee of the University of Twente (no. 13212) and registered in The Netherlands Trial Register (NTR4297). All participants gave online informed consent before participating in the study.

Design

This study is a parallel RCT conducted in The Netherlands. Eligible participants with low or moderate well-being were randomly assigned (allocation ratio 1:1) to the Dutch self-help intervention “This is your life” with email support (TL-E) or to a wait-list control group (WL). Online questionnaires were obtained at baseline, 3, 6 and 12 months. To reduce drop-out, up to three email reminders were sent when questionnaires were incomplete. A detailed description of the intervention and study design has been published in our study protocol (Schotanus-Dijkstra, Drossaert, Pieterse, Walburg, & Bohlmeijer, 2015).

Power calculation

A sample size of 99 participants per condition was required to provide a statistical power of 80% and a two-sided 5% significance to detect a standardized effect size of .40 (Cohen’s *d*) on well-being. A drop-out rate of 25% was anticipated, resulting in a required sample size of 132 participants per condition.

Participants and procedure

In January 2014, advertisements were placed in national newspapers and in an online psychology newsletter calling for people who were motivated to work on their “well-being and resilience”. Eligible participants were self-selected adults in The Netherlands, aged 18 years or above, who were willing to invest an average time of 4 hours per week in the intervention and owned a valid email address and sufficient Internet connection. Participants who gave online informed consent received a screening questionnaire. Participants were excluded from the study when they possessed (1) flourishing mental health as assessed with the Mental Health Continuum Short Form (MHC-SF, see “secondary outcomes” on p. 9 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, respectively HADS-A or HADS-D) (Spinhoven et al., 1997; Zigmond & Snaith, 1983).

Figure 1. CONSORT Flow-chart of participants.

Of the 518 eligible participants, 275 participants completed the baseline questionnaire and 251 individuals were excluded mainly due to their HADS score. After baseline, randomization took place and all participants were informed about the allocated arm. Randomization was stratified by gender and educational level (low, intermediate, high) using a computerized random number generator created with Excel. The first author was responsible for randomization, enrollment and the assignment of participants to each group. After randomization, participants received a personal email with information about their assigned group. Figure 1 shows the flow chart of participants. Assessments took place between January 2014 and February 2015. Participants who completed all four measurements could win one of the 125 gift vouchers of €50, €20 or €10 as an incentive.

Interventions

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

The self-help book “This is your life” (Bohlmeijer & Hulsbergen, 2013) is a theory-based intervention that covers 8 modules (Schotanus-Dijkstra et al., 2015). Each module consist of psycho-education and evidence-based positive psychology exercises concerning six key components of mental well-being: positive emotion, discovering and using strengths, optimism and hope, self-compassion, resilience, and positive relations (Schotanus-Dijkstra et al., 2015). Participants were instructed to use a 9-week time schedule of reading one module per week (except for module 2 which was spread out over 2 weeks) and practicing a minimum of 2 recommended exercises for each module. The study protocol provides a Table of content including a description of the recommended exercises (Schotanus-Dijkstra et al., 2015). Participants had 8 to 12 weeks to complete the program and received weekly email correspondence with a personal counselor to increase adherence. Five students of the Master Positive Psychology and Technology of the University of Twente each guided 25 participants and the remaining participants were guided by the first author. The personal counselors were trained in TL-E during a study-course and in a one-day workshop. All counselors also attended weekly supervision meetings to ensure treatment integrity. The email support was asynchronous and comprised tailored feedback on processes and progression according to the time schedule. The counselors were also instructed to use generic techniques such as positive reinforcement, paraphrasing, and motivational interviewing techniques such as providing feedback, providing support and encourage self-efficacy, and to give

instructions about exercises. Adherence to the intervention was encouraged by email reminders from the personal counselor or investigator.

WL control group

Participants in the WL group received the book “This is your life” and the 9-week time schedule after completing the 6 months assessment. Participants did not receive email support. During the study, participants in both conditions had unrestricted access to other therapies or health care services.

We had planned a third “active control” arm in which participants would have received the self-help book without email support (Schotanus-Dijkstra et al., 2015). Due to an unexpectedly high exclusion rate (143 individuals scored > 10 on the HADS-A or HADS-D) and limited study funding, we were forced to adjust the trial to two arms.

Measures

Primary outcome

Well-being was measured on all time-points with the 14-item MHC-SF, of which its total continuous scale was used as well as its subscales for emotional well-being (EWB; 3 items), social well-being (SWB; 5 items) and psychological well-being (PWB; 6 items) (Keyes et al., 2008). Each item was rated on a scale from 0 (never) to 5 (almost always). Also, social-psychological well-being was assessed with a fairly novel instrument, the 8-item Flourishing Scale (FS) (Diener et al., 2009). Items were rated on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree). Both instruments demonstrated good psychometric properties in general population samples (Hone, Jarden, & Schofield, 2013; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). Total scores ranged from 0-5 on the MHC-SF ($\alpha = .88$) and from 8-56 on the FS ($\alpha = .86$), higher scores indicating higher levels of well-being. Strong positive cross-sectional correlations between the MHC-SF and FS were found at baseline ($r = .58$), 3 ($r = .69$), 6 ($r = .72$) and 12 months ($r = .74$).

Secondary outcomes

The MHC-SF was also used as secondary outcome. The proposed criteria of the MHC-SF were used to classify participants as having flourishing mental health, moderate mental health and languishing mental health (Keyes, 2006; Keyes et al., 2008). Flourishers

score 4 or 5 on at least one EWB item together with a score of 4 or 5 on at least 6 of the 11 remaining items. Languishers score 0 or 1 on these items and those who do not fulfill to either criteria are labelled the moderately mentally healthy. In the current sample were few participants classified as languishers (4.4%). Therefore, the languishing and moderate mental health categories were merged and coded as not flourishing (opposed to flourishing).

Other secondary outcomes were anxiety and depressive symptoms as measured with the HADS-A and HADS-D (Spinhoven et al., 1997; Zigmond & Snaith, 1983). These measures were assessed at screening and 6 months in both conditions, and in the TL-E group also at 12 months. Each subscale consists of 7 items with scores ranging from 0-3. Higher total scores (0-21) on each subscale indicate more anxiety or depressive symptoms. The HADS is a widely validated instrument (Bjelland, Dahl, Haug, & Neckelmann, 2002; Spinhoven et al., 1997) and showed good internal consistency in the current sample ($\alpha = .76$ for both subscales). There were other secondary measurements included in the trial which we will not report in the current paper. A complete list of these other measures can be found in the study protocol (Schotanus-Dijkstra et al., 2015).

Moderators

Prior research has indicated that personality traits, socio-economic status, social support and positive life-events (but not negative life-events) were associated with flourishing (Keyes, 2007; Peter, Roberts, & Dengate, 2011; Schotanus-Dijkstra et al., 2016a). In the current study, we included personality traits and life-events as possible moderators. Personality traits were measured at baseline using the Eysenck Personality Questionnaire-Revised Short Scale (Sanderman, Arrindell, Ranchor, Eysenck, & Eysenck, 1995) for extraversion and neuroticism and the NEO Five Factor Inventory for conscientiousness (Costa & McCrae, 1995). Positive and negative life-events were assessed at all time-points with a modified version of the Brugha Life-events section (Brugha, Bebbington, Tennant, & Hurry, 1985). Gender, age and education were assessed at screening.

Evaluation

At 3 months, the TL-E group received the Client Satisfaction Questionnaire-short form (CSQ-8) (Attkisson & Zwick, 1982) and a self-developed process evaluation questionnaire to assess (1) the average invested time per week, (2) how each element of the intervention was evaluated on a scale from 1 to 10 (4 items: self-help book, positive psychology exercises, email support and their personal counselor), and (3) how much time was spent on each of the 8 modules, ranging from 1 (no time spent) to 5 (spent a lot of time). The number of completed modules was calculated with the latter question, with scores of 1 (no time spent) and 2 (little time spent) coded as not completed.

Statistical analyses

We followed the Consolidated Standards of Reporting Trials (CONSORT) statement (Moher et al., 2010). We used SPSS version 22.0 (IBM, Chicago, Ill., USA) and 2-tailed tests with significance level $< .05$. Missing data on the primary and secondary outcomes were imputed (7.7%; Little's MCAR test: $\chi^2 (72) = 55.91, p = .919$) using the estimation maximization algorithm (EM). This method uses the observed data in an iterative process (Dempster, Laird, & Rubin, 1977) and has been proven a highly valid and reliable method compared to other imputation techniques (Blankers, Koeter, & Schippers, 2010). We only report the intention-to-treat results because a comparison to analyses with the observed data (i.e. completed questionnaires without imputation) revealed similar results. Differences between conditions at baseline and between drop-outs and completers were analyzed using χ^2 -tests and independent t-tests. Drop-out was defined as incomplete data on the 3 and/or 6 months assessment. Condition $\times$ drop-out interactions were analyzed using analysis of variance (ANOVA). To evaluate the superiority of the intervention on primary and secondary outcomes, we used 2 (group) by 3 (time) ANOVA and *post-hoc* bonferroni test. Cohen's *d* effect sizes and 95% confidence intervals (CI's) were calculated for between group differences using SPSS scripts (Wuensch, 2012). χ^2 was used to examine the difference in the proportion of flourishers between conditions. The number needed to treat (NNT) for flourishing was also calculated at 3 and 6 months (Cook & Sackett, 1995). Within group changes from baseline to 12 months, and from 6 to 12 months were explored with paired t-tests in the TL-E group.

To examine a dose-response relationship of adherence to TL-E, regression analyses were used with well-being (MHC-SF and FS) or clinical symptomatology (HADS-A and HADS-D) as dependent variable (controlled for their baseline outcome) at 3 and 6 months and the number of sent emails and the number of completed modules as predictor variables. For these analyses, participants in the WL group were excluded because they received no intervention. The number of completed modules was self-reported and available for 122 TL-E participants.

Finally, moderation analyses were performed according to the procedure as outlined by Preacher and Hayes (2008) using the PROCESS tool (Hayes, 2012). Well-being at 3 months (controlled for well-being at baseline) or 6 months (controlled for well-being at baseline and well-being at 3 months) were entered in the regression analyses as dependent variables. The grand centered means of the potential moderators and the group $\times$ moderator interaction term were entered as independent variables. If this interaction term contributed significantly to the intervention effect, this moderator was further explored with plots.

Results

Table 1 summarizes the baseline characteristics of the sample. Mean age was 47.8 years ($SD = 10.9$), and participants were predominantly female (85.8%) and higher educated (74.5%). More than half of the participants had seen a general practitioner in the three months prior to the study (54.9%), and almost 20% had seen a mental health professional. There were no significant differences between groups on demographics and baseline measures. 253 (92.0%) participants completed the 3 months assessment and 237 (86.2%) the 6 months assessment. Overall, there were significantly more drop-outs in TL-E compared to WL [19.7% vs. 10.9%, $\chi^2(1) = 4.15$, $p = .042$]. Drop-outs and completers did not significantly differ on any of the demographics and baseline measures. Interaction tests of all baseline levels of the outcome measures revealed only a different drop-out pattern for anxiety symptoms [$F(1, 271) = 7.24$, $p = .008$], indicating that people with higher baseline anxiety symptoms in the WL group were more inclined to drop-out than people with higher baseline anxiety symptoms in the TL-E group.

Table 1. Baseline characteristics of participants in the intervention group, control group and the total sample

	TL-E (<i>n</i> = 137)	WL (<i>n</i> = 138)	Total (<i>n</i> = 275)
Age, <i>M</i> (<i>SD</i>)	48.9 (10.9)	46.7 (10.8)	47.8 (10.9)
Gender, <i>n</i> (%)			
Female	118 (86.1)	118 (85.5)	236 (85.8)
Male	19 (13.9)	20 (14.5)	39 (14.2)
Education, <i>n</i> (%)			
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, <i>n</i> (%)			
Married	57 (41.6)	61 (44.2)	118 (42.9)
Single	44 (32.1)	49 (35.5)	93 (33.8)
Separated or divorced	36 (26.3)	28 (20.3)	64 (23.3)
Nationality, <i>n</i> (%)			
Dutch	122 (89.1)	128 (92.8)	250 (90.9)
Other	15 (10.9)	10 (7.2)	25 (9.1)
Living situation, <i>n</i> (%)			
Alone	34 (24.8)	42 (30.4)	76 (27.6)
With others	103 (75.2)	96 (69.6)	199 (72.4)
Employment status, <i>n</i> (%)			
Paid employment	89 (65.0)	99 (71.7)	188 (68.4)
Unemployed or unable to work	33 (24.1)	26 (18.8)	59 (21.5)
Retired, student or homemaker	15 (10.9)	13 (9.4)	28 (10.2)
Health care use in 3 months prior to baseline, <i>n</i> (%)			
General practitioner	72 (52.5)	79 (57.2)	151 (54.9)
Psychologist, psychiatrist, mental health service	22 (16.0)	30 (21.7)	52 (18.9)

TL-E = intervention group, "This is your life" with email support; WL = wait-list control group.

Note. There were no significant group differences

Interaction effects

Table 2 shows that there was a significant time $\times$ group interaction effect on the MHC-SF, $F(1.9, 522.9) = 42.00, p < .001$, indicating that participants in the TL-E group reported a stronger increase in well-being immediately following the intervention ($d = .89, 95\%CI = .64 - 1.14$) and at 6 months ($d = .93, 95\%CI = .68 - 1.18$) than participants in the WL group. However, the interaction effect of the FS was not significant [$F(2, 546) = 2.45, p = .087$]. *Post-hoc* bonferroni test of the MHC-SF results revealed that the increase in well-being was significant from baseline to 3 months and from baseline to 6 months, but not from 3 to 6 months indicating that the initial increase was maintained. Anxiety and depressive symptoms significantly decreased more in the TL-E group between baseline and 6 months than in the WL group, $F(1, 273) = 21.65, p < .001$ and $F(1, 273) = 13.62, p < .001$ respectively. The largest effect sizes were found for the MHC-SF and its psychological well-being subscale, which were above $d = .80$ indicating large between group effect sizes.

Impact on flourishing

The proportion of flourishers (Table 3) did not significantly differ between conditions at baseline [$\chi^2 (1) = .04, p = .834$]. However, at 3 months, there were significantly more flourishers in the TL-E group compared to WL [$\chi^2 (1) = 14.06, p < .001$]. The NNT was 5.46 indicating that 1 in 5 participants achieved flourishing after the 9-week program and therefore benefited from the intervention. Comparable results were found at 6 months with a NNT of 5.25.

Long-term effects

The 12 months assessment was completed by 100 participants (73%) in the TL-E group. The WL group had received the book "This is your life" without email support after completing the 6 months assessment and therefore could not be compared with the TL-E group at 12 months. Paired t-test results demonstrated significant within-group improvement in the TL-E group from baseline to 12 months on the MHC-SF [$t(136) = 10.18, p < .001$], FS [$t(136) = 4.17, p < .001$], HADS-A [$t(136) = -5.73, p < .001$] and HADS-D [$t(136) = -5.82, p < .001$; see Table 2 for means and SDs). The proportion of flourishing in this group was highest at 12 months (33.6%).

Adherence

Most participants in the TL-E group (52%) had invested an average time of 2 to 4 hours per week in the program and evaluated the program positively. The mean on the CSQ-8 was 3.07 ($SD = .59$) and the mean grades for the book, exercises, email support and the personal counselors were 7.8 ($SD = 1.25$), 7.5 ($SD = 1.23$), 6.8 ($SD = 1.95$) and 6.8 ($SD = 1.88$) respectively. On average, participants sent 6.4 extensive emails (range = 0 – 12, $SD = 3.62$) and completed 6.4 modules (range = 0 – 8, $SD = 2.4$). We did not find a clear dose-response relationship for the number of extensive emails sent by the participant or the number of completed modules. However, we did find a marginally significant dose-response relationship for the number of completed modules and anxiety symptoms at 6 months ($b = -.204$, $p = .054$), indicating that anxiety symptoms decrease with increasing adherence.

Moderation

Table 4 shows the group x moderator interaction effects on the MHC-SF for each pre-specified moderator (age, gender, education, positive and negative life-events, extraversion, neuroticism and conscientiousness). Tests revealed no significant interaction effects for any of the moderators at 3 months. At 6 months, a significant interaction was found for neuroticism ($p = .031$). Further inspection of the data revealed that participants with low or intermediate levels of neuroticism benefited more from the intervention at 6 months than participants with high levels of neuroticism.

Table 2. Means and standard deviations for well-being and psychological distress and results of the repeated measures analysis of variance and Cohen's *d* for between group effect sizes, intention-to-treat analysis

	TL-E M (SD)			WL M (SD)			Interaction		Effect size <i>d</i> [95% CI]	
	Baseline	3 months	6 months	Baseline	3 months	6 months	<i>F</i> ^b	<i>p</i>	T0-T1	T0-T2
MHC-SF	2.56 (.62)	3.09 (.67)	3.13 (.74)	2.59 (.64)	2.64 (.66)	2.65 (.71)	42.00	< .001	.89 [.64-1.14]	.93 [.68-1.18]
EWB	2.80 (.77)	3.29 (.76)	3.42 (.86)	2.75 (.72)	2.81 (.80)	2.93 (.88)	18.10	< .001	.62 [.38-.87]	.60 [.36-.84]
SWB	2.35 (.74)	2.80 (.67)	2.76 (.80)	2.38 (.72)	2.42 (.70)	2.38 (.72)	21.70	< .001	.70 [.45-.94]	.65 [.41-.89]
PWB	2.62 (.68)	3.22 (.76)	3.28 (.81)	2.68 (.72)	2.75 (.73)	2.73 (.79)	39.55	< .001	.82 [.57-1.06]	.96 [.71-1.21]
FS	41.95 (6.19)	44.19 (6.52)	43.75 (7.57)	40.94 (6.74)	41.84 (6.24)	41.22 (7.15)	2.45	.087	.23 [-.01-.47]	.23 [-.01-.47]
HADS-A ^a	7.10 (2.43)	-	5.29 (3.08)	7.47 (2.37)	-	7.31 (3.38)	21.65	< .001	-	.56 [.32-.80]
HADS-D ^a	5.78 (2.53)	-	3.88 (4.00)	5.83 (2.42)	-	5.45 (3.37)	13.62	< .001	-	.45 [.21-.68]

CI = confidence interval; EWB = Emotional Well-being, measured with the MHC-SF; FS = Flourishing Scale; HADS-A = Hospital Anxiety and

Depression Scale-Anxiety; HADS-D = Hospital Anxiety and Depression Scale-Depression; MHC-SF = Mental Health Continuum-Short Form; PWB

= Psychological Well-being, measured with the MHC-SF; SWB = Social Well-being, measured with the MHC-SF; TL-E = intervention group, "This

is your life" with email support; WL = wait-list control group.

^a The HADS-A and HADS-D were measured at screening, approximately 2 weeks before baseline

^b When the assumption of sphericity is violated, Greenhouse-Geisser results are reported.

Table 3. Chi-square tests of the number of participants (%) with flourishing and non-flourishing mental health

	TL-E (<i>n</i> = 137)		WL (<i>n</i> = 138)		<i>p</i>
	Flourishing	Not	Flourishing	Not	
	Flourishing		Flourishing		
Screening	0	137	0	138	
Baseline	10 (7.3)	127 (92.7)	11 (8.0)	127 (92.0)	.834
3 months	41 (29.9)	96 (70.1)	16 (11.6)	122 (88.4)	<.001
6 months	42 (30.7)	95 (69.3)	16 (11.6)	122 (88.4)	<.001
12 months	46 (33.6)	91 (66.4)			

TL-E = intervention group, "This is your life" with email support; WL = wait-list control group.

Note. Flourishing was measured with the Mental Health Continuum-Short Form (MHC-SF).

Table 4. Moderator analyses of well-being (moderator x group interaction effects)

	MHC-SF at 3 months ^a			MHC-SF at 6 months ^b		
	<i>b</i>	95% CI	<i>p</i>	<i>b</i>	95% CI	<i>p</i>
Demographics						
Age	.01	-.00 – .02	.097	.00	-.01 – .01	.776
Gender	.10	-.27 – .47	.607	-.16	-.50 – .17	.338
Education	-.17	-.42 – .09	.207	-.13	-.34 – .08	.218
Life events						
Positive events before baseline	.14	-.13 – .41	.312			
Negative events before baseline	.01	-.26 – .27	.960			
Positive events between baseline and 6 months				.18	-.06 – .42	.142
Negative events between baseline and 6 months				.16	-.08 – .40	.178
Personality traits						
Extraversion	-.01	-.04 – .03	.784	-.02	-.05 – .01	.159
Neuroticism	.00	-.04 – .04	.965	-.04	-.07 – .00	.031
Conscientiousness	-.00	-.02 – .02	.964	.00	-.02 – .02	.964

MHC-SF = Mental Health Continuum-Short Form. *b* refers to the unique contribution of the interaction term (moderator x group) in the prediction of the MHC-SF after controlling for the separate effects of group and moderator, and MHC-SF at baseline (or baseline and 3 months).

^a Controlled for well-being at baseline

^b Controlled for well-being at baseline and 3 month

Discussion

The promotion of flourishing as an optimal level of mental health seems to be important for reducing the incidence and prevalence of mental disorders (Grant et al., 2013; Keyes et al., 2010). However, it is not known whether it is possible to enhance flourishing in people with low or moderate well-being, considered as a new public mental health approach. In the current study, we aimed to answer this question. We evaluated the short-term and long-term effectiveness of a multicomponent and guided self-help intervention in persons with languishing or moderate mental health. Results of this 9-week multicomponent self-help program demonstrated that the early intervention was superior to a WL condition in increasing mental well-being (MHC-SF) and the proportion of flourishers, as well as in decreasing anxiety and depressive symptoms (HADS) up to 6 months. The results for social-psychological well-being as measured with the FS did not reach statistical significance. Overall, it seems fruitful for people with less than optimal well-being to actively invest in a multicomponent positive intervention, even in achieving the highest levels of emotional, social and psychological well-being. In particular, the proportion of flourishers in the TL-E group had increased from 7% at baseline to 34% at 12 months, indicating that the intervention was able to enhance the proportion of flourishers up to the average population level of 37% with flourishing mental health in The Netherlands (Schotanus-Dijkstra et al., 2016a).

The large sized between-group effects on the MHC-SF and its PWB subscale were similar to some previous multicomponent positive interventions (Page & Vella-Brodrick, 2012; Rashid, 2014). However, these prior studies showed generally larger absolute effect sizes which could have been overestimated by their small sample sizes. Compared to a study that also used a self-help book with email support, the current study demonstrated larger effect sizes on well-being and smaller effect sizes on anxiety and depression. This finding suggests that both positive interventions were adequately designed for different target groups because the prior study was designed and evaluated among people with mild to moderate depressive symptomatology. Future studies using TL-E might also include people with moderate anxiety or depressive symptoms and examine whether higher effect sizes can be found on these outcomes. Furthermore, we found considerable larger effect sizes than has been found in a recent meta-analysis of mostly single component positive psychology interventions (Bolier et al., 2013), indicating that it seems more effective to invest in *multicomponent* well-being interventions. Finally, the large sized effects in the current study (opposed to small effect sizes) could also be partly explained by the use of a wait-list control group rather than

treatment as usual (Sin & Lyubomirsky, 2009) and the use of weekly and tailored email support from personal counselors. Regarding the latter, effect sizes of web-based treatments for depression increased from small to medium when personal support was added to the treatment (Andersson & Cuijpers, 2009).

It was puzzling to find contradictory results for the MHC-SF and FS, both acclaimed to be measures of social and psychological well-being. Our findings might indicate that the MHC-SF and FS contain different facets of well-being, although intercorrelations found in the current study were relatively low. Other explanations might be that the FS is less sensitive to change, especially with regard to the transition from moderate mental health to flourishing, and that there might be insufficient room for improvement on the FS as a consequence of the positive skewness of the scale (Hone, Jarden, Schofield, & Duncan, 2014; Schotanus-Dijkstra et al., 2016b). Researchers should be aware of these possible limitations of the FS, especially in intervention studies aimed at increasing mental well-being.

The present study makes several contributions to the mental health literature. First, our study is the first to our knowledge that adopted Keyes' (2007) classification model of well-being for participant selection as well as for developing and evaluating the intervention. We demonstrated that it is possible for people to increase their well-being up to a flourishing mental health status using an early intervention based on a positive framework. This is important because low and moderate well-being is highly prevalent in the USA and Europe, regardless of mental illness (Huppert & So, 2013; Keyes, 2005, 2007; Schotanus-Dijkstra et al., 2016a). For example, Keyes (Keyes, 2005) found that nearly 75% of American adults had no common mental disorder, but about 80% of them showed less than optimal well-being. Hence, our findings are promising from a public mental health perspective as languishing and moderate mental health are risk factors for developing mental disorders later in life (Grant et al., 2013; Keyes et al., 2010; Lamers et al., 2015; Wood & Joseph, 2010). A future study will test whether our program is also cost-effective, which seems plausible since we used a relatively low-cost intervention. Second, although between-group comparisons were confined to 6 months, our study did follow participants for 12 months, which is a rarity in positive psychology intervention studies. Promisingly, these results suggest that the intervention has enduring positive effects on well-being, flourishing, anxiety and depression. Third, we were the first to include life-events and personality traits as possible moderators of change in a multicomponent positive intervention. Moderator analyses revealed that participants with a high level of neuroticism benefited less from the intervention, which

may point to future research about how to improve similar interventions for this group. However, as we did not find any other significant moderator effect, this also suggests that the self-help book in combination with email support is suitable for a rather heterogeneous target group.

Limitations

Our study's conclusions are primarily limited by the use of a wait-list control group and the self-selected study sample. Although we had planned to conduct a three-arm trial with an active control group (Schotanus-Dijkstra et al., 2015), obviously, drawing conclusions on the added effect of email support to the self-help program was impeded by using only a wait-list control group. Furthermore, our results should be interpreted with care because our self-selected sample with an overrepresentation of higher educated, middle aged, female participants limits the generalizability of the findings. As this is common in similar studies, this does not affect the comparability of our results to previous studies. This also indicates that researchers are challenged to reach lower educated people of all ages, as well as more men which is especially important for large-scale implementation of the intervention. A final limitation is that our study was not powered for our moderation analyses.

Practical implications and future research

Our findings are relevant for clinical psychiatry, primary care, public mental health and policy. Clinical psychiatry needs innovative preventive approaches for seeking effective solutions for mental suffering (Insel & Scolnick, 2006). A new promising strategy might be to focus on non-flourishers with mild anxiety or depressive symptoms who are motivated to work on their well-being and resilience. The intervention "This is your life" could be offered as an early intervention in mental health services, maybe even for those people who are waiting for psychological treatment. Future research could also test the applicability and efficacy of the intervention in relapse prevention or as a complementary intervention integrated within regular treatments. Hence, a large and diverse population for mental health promotion might possibly be reached for the prevention of first or recurrent symptoms of mental illness. In this regard, the MHC-SF, which is already available in a wide variety of languages, could help professionals with screening, selection or monitoring of mental well-being in addition to mental illness.

The study findings may especially be relevant for primary care. For example, the intervention could be considered as a first step in collaborative care or stepped care models. A promising finding from our study was that more than half of the participants had seen a general practitioner in the three months prior to the study, indicating that this group—at risk for developing anxiety or depression—might be effectively reached in primary care. More research is needed to identify a more specific risk profile, which can then be used as a screening tool in primary care and in mental health services. Furthermore, an online version of the intervention has potential to reach individuals on an even larger scale. Adding automated support to this type of intervention could ensure similar effects and adherence rates (Kelders, Bohlmeijer, Pots, & van Gemert-Pijnen, 2015) towards lower costs.

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Chapter 7

Cost-Effectiveness of an Early Intervention to Promote Flourishing and Prevent Anxiety and Depression: An Email Guided Self-Help Intervention versus Usual Care

This chapter is submitted as:

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Abstract

Objectives: Deteriorating mental health could be prevented by early positive psychology (PP) based interventions. Such interventions are attractive for the general public, but economic evaluations are scarce. The aim was to examine the cost-effectiveness of a PP-based self-help book with some guidance over the Internet.

Methods: Participants with suboptimal levels of mental well-being were randomly assigned to email guided bibliotherapy (n=137) or wait-list control group (n=138). Direct medical and non-medical costs, flourishing mental health and treatment response on anxiety and depressive symptoms were assessed at baseline and 6 months follow-up.

Results: Bootstrapped mean incremental cost-effectiveness ratios were €2359 (\$2899) for flourishing, €2959 (\$3637) for anxiety and €2578 (\$3168) for depression, suggesting large health gains at low additional costs. At a willingness to pay ceiling of €10,000 (\$12,290) for a treatment response, the probability that the intervention is deemed cost-effective is 90-93%.

Conclusions: A promising strategy for public mental health is to promote a flourishing mental health state, and to reduce symptoms of anxiety and depression through guided PP-based bibliotherapy. Outcome monitoring during large-scale implementation is recommended to guarantee the long-term effectiveness of the intervention.

Introduction

A new cost-effective strategy for the prevention of anxiety and depressive disorders might be to promote a flourishing mental health state in people with low or moderate levels of mental well-being (Forsman et al., 2015; Kobau et al., 2011). Earlier studies demonstrated that these people have an increased health care use (Kim, Park, Sun, Smith, & Peterson, 2014) with concomitant health care costs and productivity losses (Hamar, Coberley, Pope, & Rula, 2015; Keyes, 2007; Keyes & Grzywacz, 2005; Kim et al., 2014). Flourishing is defined as the presence of *high levels* of emotional well-being (e.g. life-satisfaction, positive affect) in combination with *high levels* of social and psychological well-being (e.g. social contribution, positive relationships, self-acceptance, purpose in life) (Hone, Jarden, Schofield, & Duncan, 2014; Keyes, Shmotkin, & Ryff, 2002).

Longitudinal studies have shown that flourishing helps to protect against first-onset and recurrence of diagnosed mood and anxiety disorders (Keyes, Dhingra, & Simoes, 2010; Schotanus-Dijkstra, ten Have, Lamers, de Graaf, & Bohlmeijer, 2016). Other promising results stem from two of our randomized controlled trials demonstrating that individuals are able to improve their well-being up to flourishing levels using email guided bibliotherapy based on a positive psychology or related framework (Bohlmeijer, Lamers, & Fledderus, 2015; Schotanus-Dijkstra et al., Submitted-a). The same studies also found beneficial effects on anxiety and depressive symptoms, suggesting that deteriorating mental health could be prevented by such self-help interventions. Self-help books are widely available and have the purpose to reach the lay public (Schueller & Parks, 2014). However, it is yet unknown whether positive psychology (PP) based bibliotherapy programs are cost-effective (Cavanagh, Strauss, Forder, & Jones, 2014). The present economic evaluation uses our trial data of an early intervention for people with suboptimal levels of mental well-being (Schotanus-Dijkstra et al., Submitted-a). We hypothesized that this PP-based self-help intervention with some guidance over the Internet was also cost-effective relative to usual care alone.

Methods

Design and participants

The randomized controlled trial was conducted in two parallel groups, with computerized randomization using Excel (1:1 allocation) and stratified for gender and education (low, medium, high). The design of the study (Schotanus-Dijkstra, Drossaert, Pieterse, Walburg, & Bohlmeijer, 2015) and its main findings (Schotanus-Dijkstra et al., Submitted-a) are published elsewhere. Participants were recruited from the general Dutch population in January 2014 via national advertisements calling for people who were motivated to work on their “well-being and resilience”. The inclusion criteria were: (1) aged 18 years and over, (2) willing to invest an average time of 4 hours per week for 9 weeks, (3) accesses to email and the Internet, (4) provided online informed consent before screening took place and (5) completed the screening and baseline questionnaires. Eligible participants were excluded when they already met the criteria for a flourishing mental health status as measured and classified with the Mental Health Continuum-Short Form (MHC-SF) (Keyes, 2006; Keyes et al., 2008) or when they presented scores above 10 on at least one subscale of the Hospital Anxiety and Depression Scale (HADS), indicating moderate or severe anxiety or depressive symptoms (Zigmond & Snaith, 1983).

In total, 518 participants were interested in participating in the study, of which 251 participants had to be excluded (Schotanus-Dijkstra et al., Submitted-a). The final sample of 275 participants were allocated to the intervention group ($n = 137$) or the wait-list control group ($n = 138$). The trial protocol was approved by the Ethics Committee of the University of Twente (no. 13212) and registered at The Netherlands Trial Register (NTR4297).

Interventions

Participants in the intervention group received (1) the self-help book “This is your life” (Bohlmeijer & Hulsbergen, 2013), (2) a 9-week time schedule for reading the book with recommended exercises, and (3) weekly email support from a personal counselor. The book consists of eight chapters containing psycho-education, theoretical background information, and a variety of evidence-based exercises from positive psychology, but also from mindfulness and acceptance and commitment therapy. The purpose of the book is to improve an individual’s capacity to savor positive emotions, discover and use character strengths, encourage flow and an optimistic attributional style, develop self-

acceptance and compassion, learn to cope with adversity (resilience), and encourage to share and connect with others (Schotanus-Dijkstra et al., 2015). The chapter about discovering and using character strengths was spread out over 2 weeks in the time schedule. Participants had 8 to 12 weeks to complete the program. A full description of each chapter and recommended exercises can be found elsewhere (Schotanus-Dijkstra et al., 2015).

Once a week, participants emailed their personal counselor with their experiences about the chapter and corresponding exercises. Five positive psychology students each guided 25 participants and the first author guided the remaining participants. The counselors were trained in providing email support during a study course plus an one-day workshop. In addition, they attended weekly supervision meetings. The email correspondence was aimed at increasing adherence. On average, participants reported that they had completed 6.4 (out of the 8) chapters ($SD = 2.4$) and had sent 6.4 extensive emails ($SD = 3.62$), indicating adequate adherence to the protocol (Schotanus-Dijkstra et al., Submitted-a).

Participants in the wait-list control group received the self-help book “This is your life” and the 9-week time schedule after completing the 6 months assessment. Participants in both conditions had unrestricted access to usual care.

Health related outcomes

The primary outcome was flourishing mental health and the secondary outcomes were anxiety and depressive symptoms. Self-reported data were obtained from online questionnaires at baseline and 6 months follow-up.

Flourishing

The 14-item MHC-SF measures mental well-being on a continuous scale but can also classify people into (1) flourishing mental health, (2) moderate mental health or (3) languishing mental health (Keyes et al., 2008; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). This categorical approach was chosen for ease of interpretation in the context of this health-economic evaluation, although we put the latter two categories together because there were few people with languishing mental health in the current sample (4.4%). The first three items of the MHC-SF measure emotional well-being (i.e. happiness, interest, life-satisfaction), the next five items measure social well-

being (i.e. social contribution, social integration, social actualization, social acceptance, social coherence) and the last six items tap into psychological well-being (i.e. self-acceptance, mastery, positive relations, personal growth, autonomy, purpose in life). Each item was scored on a 6-point scale from 0 (never) to 5 (almost always). Flourishing is operationalized as scoring 4 or 5 on at least one emotional well-being item together with a score of 4 or 5 on at least 6 of the 11 remaining items (Keyes, 2006; Keyes et al., 2008). The Dutch version of the MHC-SF has shown good psychometric properties (Lamers et al., 2011) and showed good internal consistency in the current study ($\alpha = .88$).

Anxiety and depressive symptoms

Anxiety and depressive symptoms were measured with the HADS-A and HADS-D respectively. Each subscale has 7 items with scores ranging from 0-3. Total summed scores range from 0-21, with higher scores indicating greater anxiety or depressive symptom severity. The HADS has shown good psychometric properties in the Dutch population (Bjelland, Dahl, Haug, & Neckelmann, 2002; Spinhoven et al., 1997) and showed good internal consistency in the current sample ($\alpha = .76$ for both subscales). To measure treatment response on these scales, the Jacobson and Truax method (Jacobson & Truax, 1991) was applied to obtain the reliable change index to distinguish between treatment responders and non-responders. A reliable improvement was estimated to be a pre-post change of at least 2.22 points on the anxiety subscale and 2.55 points on the depression subscale.

Resource use and costing

The current study adopts a health sector perspective in accordance with national UK and US guidelines (Husereau et al., 2013; NICE, 2013). Therefore, direct medical costs (health service use), direct non-medical costs (travel costs to health services) and intervention costs were included and not productivity losses. Resource use was measured with the Medical Consumption Questionnaire (MCQ) for three periods: 3 months before baseline (T0), baseline to 3 months follow-up (T1) and 3 to 6 months follow-up (T2) (Bouwman et al., 2013). All costs are expressed in euros (€) for the reference year 2014. The main results are also expressed in US dollars (\$). The general purchasing power parity (PPP) was used for conversion of the € to \$ for 2014 (US\$1.00 = NL€0.814) (OECD, 2016).

Direct medical and non-medical costs

Table 1 displays an overview of health service units (contacts or hours) and their standard unit cost price as reported in the Dutch guidelines for health-economic evaluations (ZorginstituutNederland, 2015). Health service costs per participant were calculated by multiplying the utilized health service units of each participant in the past 3 months with the standard unit cost price of that service. Travel costs for each health service visit were calculated by multiplying the average distance to that service according to the Dutch guidelines (see Table 1) with the costs per km (€0.19). Parking costs were added to the travel costs which amounted to €3 per visit.

Table 1. Unit cost price for direct medical and direct non-medical costs by the reference year 2014.

Health service type	Direct medical costs		Direct non-medical costs	
	Unit	Unit cost price	km	Unit cost price
Family doctor – standard consult	Contact	33	1,1	3.21
Family doctor – mental health	Contact	66	1,1	3.21
Family doctor – home visit	Contact	50	NA	NA
Company doctor	Contact	33	17,6	6.34
Social worker	Contact	65	5	3.95
Regional mental health center	Contact	112	10	4.90
Regional addiction center	Contact	112	10	4.90
Independent psychologist, psychotherapist, psychiatrist	Contact	94	7	4.33
Psychologist, psychotherapist, psychiatrist in hospital ^a	Contact	91	7	4.33
Self-help group	Hour	14	7	4.33
Alternative healer ^b	Contact	55	5	3.95

^a Unit cost price was based on a weighted mean of a general and academic hospital.

^b Unit cost price was based on own calculation as weighted average of homeopath and acupuncturist.

Intervention costs

Each participant in the intervention group received the self-help book “This is your life” which was valued at €25 in 2014 as found in a large and representative online bookstore in The Netherlands. Each participant also received personal email support. Although the current study used students as counselors, in real-life health care settings these will be replaced by the family doctor’s mental health nurse at €17 per consult (ZorginstituutNederland, 2015). We assume an average of nine email contacts, which puts the costs at €17 * 9 contacts = €153 per participant. Additional costs were incurred for recruitment, screening and training costs for the mental health nurse at €44 per participant in a real-world setting. In total, the estimated intervention costs were €222 (\$273) per participant.

Analyses

Statistical analyses

Analyses of the health related outcomes were carried out in accordance with the intention-to-treat principle. Missing data on the MHC-SF, HADS-A and HADS-D at T2 were imputed using the expectation maximization (EM) algorithm in SPSS (IBM, Chicago, Ill., USA) version 22.0.

Cost-effectiveness analyses

The Consolidated Health Economic Evaluation Reporting Standards (CHEERS) were followed (Husereau et al., 2013). Therefore, the intention-to-treat principle was also applied to the cost data and these were imputed using EM. In order to compare our results with other cost-effectiveness studies, costs were annualized by multiplying the costs of three months by 4. No discounting of costs and effects was applied because the study’s follow-up did not exceed one year (Husereau et al., 2013).

The annualized T2 data were used to calculate the incremental cost-effectiveness ratio (ICER): $(C_1 - C_0) / (E_1 - E_0)$, where C is the average annualized per-participant health care costs and E is the proportion of flourishers (or treatment responders on the HADS). The subscripts 1 and 0 refer to the intervention and control condition, respectively. The ICERs represent the incremental costs per additional treatment responder in the intervention as compared to the control group. A Microsoft Excel macro was used to simulate 2500 ICERs in a non-parametric bootstrap procedure. With this resampling

procedure, each estimated ICER was plotted in a cost-effectiveness plane. A cost-effectiveness acceptability curve was also plotted, providing insight into the probability of accepting the intervention as cost-effective relative to the control condition given various levels of willingness to pay (WTP) for an additional health gain (treatment responder).

Sensitivity analysis

The analyses were repeated for three different scenarios to examine the robustness of the results. In scenario A, the intervention costs were based on the actual number of emails sent by the personal counselor to the participant (not the assumed maximum of 9 emails) and then multiplied by the costs for consulting a family’s doctor mental health nurse (€17). In scenario B, the intervention costs were raised by including the time investment of participants (valued at 3 hours * 9 weeks * €14) amounted to a total of €600 per participant. In scenario C, completers-only analyses were performed, using data of the 112 participants in the intervention condition and 125 participants in the control condition who completed all measurements at T2.

Results

Sample characteristics

Table 2 shows the baseline characteristics of participants in both conditions. In the total sample, participants were predominantly female (85.8%), higher educated (74.5%) and in paid employment (68.4%). Mean age was 47.8 years (SD = 10.9). The mean score of the total sample for mental well-being was 2.57 (SD = 0.63), for anxiety symptoms 7.28 (SD = 2.41) and for depressive symptoms 5.80 (SD = 2.47).

Table 2. Participant characteristics and main outcome measures at baseline for the guided positive self-help intervention and wait-list control condition.

	Intervention (<i>n</i> = 137)	Control (<i>n</i> = 138)
Participant characteristics		
Mean age, years (SD)	48.9 (10.9)	46.7 (10.8)
Female, <i>n</i> (%)	118 (86.1)	118 (85.5)
Education, <i>n</i> (%)		
Low	5 (3.6)	5 (3.6)
Intermediate	30 (21.9)	30 (21.7)
High	102 (74.5)	103 (74.6)
Married, <i>n</i> (%)	57 (41.6)	61 (44.2)
Living with others, <i>n</i> (%)	103 (75.2)	96 (69.6)
Employment status, <i>n</i> (%)		
Paid employment	89 (65.0)	99 (71.7)
Unemployed or unable to work	33 (24.1)	26 (18.8)
Retired, student or homemaker	15 (10.9)	13 (9.4)
Main outcome measures		
MHC-SF well-being, mean (95% CI)	2.56 (2.45-2.67)	2.59 (2.47-2.70)
HADS-A anxiety, mean (95% CI)	7.10 (6.69-7.52)	7.47 (7.05-7.86)
HADS-D depression, mean (95% CI)	5.78 (5.34-6.21)	5.83 (5.42-6.23)

HADS-A = Hospital Anxiety and Depression Scale-Anxiety; HADS-D = Hospital Anxiety and Depression Scale-Depression; MHC-SF = Mental Health Continuum-Short Form.

Health effects

At 6 months, there were 42 participants (30.7%) with flourishing mental health in the intervention condition and 16 participants (11.6%) in the control condition ($\chi^2 = 15.01$, $df = 1$, $p = < .001$). The incremental effect was $.31 - .12 = .19$. Similar effects were found for anxiety and depressive symptoms. For the HADS-A, 57 participants (41.6%) in the intervention group met the criteria for treatment response compared to 27 participants (19.6%) in the control group ($\chi^2 = 15.74$, $df = 1$, $p = < .001$). For the HADS-D, these number of participants were 59 (43.1%) in the intervention group and 30 (21.7%) in the control group ($\chi^2 = 14.29$, $df = 1$, $p = < .001$). The incremental effects were $.42 - .20 = .22$ for anxiety symptoms and $.43 - .22 = .21$ for depressive symptoms.

Costs

At baseline, total average annualized direct medical and direct non-medical costs were €581 (SD = €1190) in the intervention condition and €675 (SD = €1246) in the control condition. At T1, these costs were €432 (SD = €983) and €658 (SD = €1224) respectively. At T2, these costs were €506 (SD = €1001) for the guided self-help intervention and €488 (SD = €1190) for usual care. These T2 annualized costs were used for the cost-effectiveness analyses, adding the intervention costs of €222 to the intervention condition. Therefore, the annualized incremental costs at the trial's follow-up were €728 – €488 = €240 (\$295).

Cost-effectiveness: Flourishing

The bootstrapped mean ICER shows that additional costs of €2359 (\$2899) had to be paid to improve one person from low or moderate well-being to flourishing mental health. The bootstrapped median ICER showed additional costs of €1245 (\$1530). The majority of the plotted ICERs (92%) occurred in the northeast quadrant, indicating that the intervention produced health gains at additional costs (Figure 1). All other plotted ICERs occurred in the southeast quadrant (8%), which implies health gains at lower costs. When there is no WTP, there is a 12% probability that the guided self-help intervention is more cost-effective relative to usual care (Figure 2). This probability increases to 93% with a WTP ceiling for a favorable treatment outcome of €10,000 (\$12,290). Conversely, with a probability of 80% the WTP is approximately €8000 (\$9832).

Cost-effectiveness: Anxiety and depressive symptoms

The bootstrapped mean and median ICERs for treatment response on anxiety symptoms were €2959 (\$3637) and €1095 (\$1346) respectively, and for depressive symptoms €2578 (\$3168) and €1189 (\$1461). The distribution of the 2500 bootstrapped ICERs on the cost-effectiveness plane as well as the WTP curve show similar results as has been found for flourishing: 91% and 90% of the ICERs were plotted in the northeast quadrant for anxiety and depressive symptoms respectively. The probability of accepting the intervention in favor of usual care with no WTP was 13% for both outcomes. At a WTP of €10,000, the probability of accepting the intervention had risen to 92% and 93% respectively.

Figure 1. Cost-effectiveness plane of 2500 bootstrapped incremental cost-effectiveness ratios (ICERs), representing the between-group differences of annualized per participant costs (x-axis) and the proportion of people with flourishing mental health (y-axis).

Figure 2. Cost-effectiveness acceptability curve of flourishing mental health. Probability of accepting the guided self-help intervention relative to usual care given varying hypothetical willingness to pay ceilings.

Sensitivity analyses

The results from the alternative scenarios show similar patterns for all three outcomes. Most mean and median bootstrapped ICERs were lowest in scenario A based on the actual intervention costs with mean ICERs between €1848 (\$2271) and €2109 (\$2592) and median ICERs between €883 (\$1085) and €1058 (\$1334). Scenario B (intervention costs including the opportunity costs of the participants loss of leisure time) revealed the highest mean ICERs €3384 - €4534 (\$4159 - \$5572) and median ICERs €2785 - €3240 (\$3423 - \$3982). In scenario C the completers-only analysis, the mean ICERs fell between €1026 (\$1261) and €2112 (\$2596), and the median ICERs fell between €904 (\$1111) and €1099 (\$1351). The percentage of ICERs on the cost-effectiveness planes for treatment response lies between 86% (scenario A) and 100% (scenario B). Furthermore, the probability of accepting the intervention over the control condition at no WTP lies between 4% (scenario B) and 18% (scenario A). In sum, these sensitivity analyses provide support for the robustness of the main analysis.

Discussion

This health-economic evaluation is the first of its kind evaluating the cost-effectiveness of bibliotherapy based on a positive psychology framework. Participants with low or moderate levels of mental well-being received the book “This is your life” with email support or were placed on a wait-list (with full access to usual care). Results demonstrated that the intervention was effective at 6 months, showing significant improvements in mental well-being (from non-flourishing to flourishing mental health) while also decreasing both anxiety and depressive symptom severity. However, owing to the intervention costs, the health care costs at 6 months were higher in the intervention group than the control group. The intervention costs were varied in sensitivity analyses, but all findings pointed in the same direction: substantial health gains can be expected from the intervention against an increase in health care costs of some €883 ~ €4534 (\$1085 ~ \$5572). From a decision-making point of view it might be worthwhile to note that the probability of regarding the intervention as cost-effective exceeds 90% at a willingness to pay of €10,000 (\$12,290) per treatment responder.

These findings corroborate prior findings from cost-effectiveness analyses of (guided) bibliotherapy for depression (Smit et al., 2006; Vos, Corry, Haby, Carter, & Andrews, 2005) and binge-eating disorder (Lynch et al., 2010), although these interventions were based on cognitive behavioral therapy (CBT). Economic evaluations of web-based self-help interventions (mostly CBT-based) for mental health are more abundant (Donker et al., 2015). To our knowledge, only one prior study evaluated the cost-effectiveness of a PP-based intervention or therapy (Bolier et al., 2014). This unguided web-based self-help intervention for people with mild to moderate depressive symptoms revealed substantially higher mean ICERs for mental well-being (€21,319) and depression (€9807) compared to the current study (€2359 and €2578 respectively). However, direct comparison of the ICERs is hindered by differences between both studies (e.g. outcome measures, societal vs. health care perspective, unguided web-based vs. guided bibliotherapy) despite some similarities in study design (e.g. recruitment strategy via newspapers in The Netherlands, mainly higher educated females and non-flourishers, a multicomponent PP structure, type of control condition). Given this evidence, guided PP-based and CBT-based bibliotherapy seem adequate interventions for the promotion of mental well-being and the prevention of anxiety and depression.

Strengths and limitations

Main strengths of the study were its well-powered and randomized controlled design, the high adherence rates and results that appeared robust under sensitivity analyses. Also, as the self-selected sample of “well-being-seekers” recruited in the general Dutch population is congruent with usual recruitment strategies for self-help interventions in The Netherlands, the sample is representative for future applications of this intervention. However, we cannot generalize to the (unselected) general population because our sample overrepresented well-educated women in their late forties with paid jobs. An important limitation of the current study relates to the lack of an active control group (and assessing treatment expectations in each group; Boot, Simons, Stothart, & Stutts, 2013) wherein the self-help book could have been offered without email support, as was planned (Schotanus-Dijkstra et al., 2015) but not feasible (Schotanus-Dijkstra et al., Submitted-a). Prior studies demonstrated larger effects of guided CBT-based self-help than its unguided counterpart in improving mental well-being, anxiety and depression (Beshai, Wallace, McDougall, Waldmann, & Stea, 2016; Cavanagh et al., 2014; Donker et al., 2015). Hence, we cannot rule out the influence of adding email support to the PP-based bibliotherapy. Other limitations include the relatively short follow-up of 6 months, the use of a wait-list control group (rather than usual care alone), unblinded participants, and the absence of assessing quality-adjusted life years (QALY's) which is a preferred outcome in health-economic evaluation (Evers, Salvador-Carulla, Halsteinli, & McDaid, 2007; Husereau et al., 2013). However, we had to consider respondent burden and decided to include other measures to gain insight into the working mechanisms of the intervention (Schotanus-Dijkstra, Pieterse, Drossaert, Walburg, & Bohlmeijer, Submitted-b).

Public health implications

A valuable approach for public mental health seems to enhance flourishing mental health because this status has been related to reduced risk of developing anxiety and depressive symptoms and mortality (Keyes et al., 2012; Keyes & Simoes, 2012; Keyes et al., 2010; Schotanus-Dijkstra et al., 2016). The results of the present study demonstrated that an early intervention based on PP principles has the potential to promote a flourishing mental health status and substantially reduce anxiety and depressive symptom severity at some additional costs. The intervention could offer good value for money when there is a WTP of around €8000 (\$9832), which corresponds to a probability of 80% that the intervention is more cost-effective compared to usual care. Even when the intervention costs are tripled by including the time costs of the participants, the WTP for a probability

of 80% falls around €8000 (\$9832). The economic costs of the intervention would rise from €2359 (\$2899) for one additional person to improve from suboptimal well-being to flourishing in the main analysis to €4534 (\$5572) when intervention costs are tripled. However, when there is no WTP for a treatment response, there is only a 12-13% probability that the intervention is more cost-effective relative to usual care. Thus, it remains a challenge to further optimize the cost-effectiveness of PP-based self-help interventions. Perhaps this can be achieved by shortening and refining the current program and focus on its most efficacious processes: enhancing positive relations, self-compassion, use of strengths and positive emotions (Schotanus-Dijkstra et al., Submitted-b). In addition, it remains a great challenge to reach people with a lower socio-economic status, also with PP-based interventions.

Future research should replicate our findings and examine longer-term costs and benefits of PP interventions to promote flourishing. In this regard, we recommend large-scale implementation of the guided bibliotherapy program in public mental health or primary care wherein the intervention costs and effects are carefully monitored for more than one year. It is also of utmost importance to conduct economic evaluations of a guided versus unguided PP-based interventions which could shed light on the added value of therapist involvement. Furthermore, a cost-effectiveness study wherein a self-help intervention based on CBT is compared with a self-help intervention based on PP would be interesting because a prior study found that both CBT and PP were efficacious in ameliorating mental well-being and depression, but that the PP-based intervention was significantly more preferred, thus, having an impact on a larger population (Parks & Szanto, 2013). Overall, a PP-based self-help intervention with some guidance over the Internet has the potential to reach large groups of people via public mental health services and primary care and might hold promise as a worthwhile alternative to the predominant CBT-based self-help interventions. We hope the current study inspires researchers to plan and conduct economic evaluations alongside their trials to address this gap in the mental health promotion literature (Bower, Richards, & Lovell, 2001; Cavanagh et al., 2014; Lewis, Pearce, & Bisson, 2012).

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Chapter 8

Mechanisms in a Multicomponent Email Guided Positive Psychology Intervention to Improve Mental Well-being, Anxiety and Depression: A Multiple Mediation Model

This chapter is submitted as:

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Abstract

The efficacy of several multicomponent positive psychology interventions (PPIs) have been demonstrated, but little is known about its possible mechanisms of change. We examined (1) the efficacy of an email guided self-help PPI on six core well-being processes (positive emotion, use of strengths, optimism, self-compassion, resilience and positive relations) and (2) the mediating role of these processes on mental well-being, anxiety and depressive symptoms. Adults ≥ 18 years were recruited in the general population and randomized into the intervention ($n = 137$) or wait-list control group ($n=138$). Repeated measures analyses showed that the intervention group improved significantly more than the control group on all six processes. Improvement (T0-T1) on each process mediated improvement (T0-T2) on mental well-being, anxiety and depressive symptoms. Single-mediation analyses revealed small to moderate effect sizes. Multiple-mediation analyses revealed most pronounced results for positive relations and self-compassion. We concluded that positive relationships and self-compassion are key mechanisms in promoting well-being.

Introduction

There is a rapidly growing interest for well-being as an important aspect of mental health and an important outcome of treatment (Forsman et al., 2015; Jeste, Palmer, Rettew, & Boardman, 2015; Kobau et al., 2011; Wood & Tarrier, 2010). Mental well-being is a complex and multidimensional phenomenon that encompasses various emotional, psychological and social dimensions. Each of these dimensions can be cultivated through positive psychological interventions (PPIs), which consists of exercises aimed at promoting thriving individuals and optimal functioning (Pawelski, 2016; Schueller & Parks, 2014; Seligman & Csikszentmihalyi, 2000). Examples of such exercises are savoring, expressing gratitude, doing acts of kindness and meditation practices. Both standalone exercises and multicomponent interventions—programs wherein various exercises on different well-being processes are integrated—have shown beneficial effects on mental well-being and depressive symptoms (e.g. Bolier et al., 2013a; Bolier et al., 2013b; Page & Vella-Brodrick, 2012; Parks & Szanto, 2013; Rashid, 2014; Ruini, Albieri, & Vescovelli, 2014; Sin & Lyubomirsky, 2009). However, it is yet unknown how and through which mechanisms such PPIs work (Schueller & Parks, 2014). What makes these types of interventions successful? And which core well-being processes are vital for achieving improved mental health?

Mediation analyses are needed to help us understand possible mechanisms of change during early treatment (Kazdin, 2009; Preacher & Hayes, 2008) because this helps us to select the active ingredients to be used in well-being interventions (Kraemer, Wilson, Fairburn, & Agras, 2002). For instance, Fredrickson and colleagues (2008) demonstrated that loving-kindness meditation improved daily positive emotions, which in turn influenced life-satisfaction and depressive symptoms. Another study revealed that self-efficacy, positive thinking, altruism and goal setting were the mechanisms of change during a multicomponent resilience program (Yu, Lam, Liu, & Stewart, 2015).

In this paper, we present a planned follow-up study of a multicomponent self-help PPI which has been shown (cost-)effective in ameliorating mental well-being, anxiety and depressive symptoms in people with suboptimal levels of mental well-being (Schotanus-Dijkstra et al., Submitted-a; Schotanus-Dijkstra et al., Submitted-b). This intervention targeted six core well-being processes derived from theoretical foundations and empirical evidence (Lyubomirsky & Layous, 2013; Ryff, 1989; Schueller & Parks, 2014; Seligman, Steen, Park, & Peterson, 2005; Seligman, 2011): positive emotion, use of strengths, optimism, self-compassion, resilience and positive relations. Each of these

processes were targeted by a combination of psycho-education and positive psychological exercises. In the current study, we examined (1) whether an email guided self-help intervention was effective in enhancing the six core well-being processes during treatment lasting up to 6 and 12 months follow-up, and (2) to what extent the change in these six processes during treatment individually and simultaneously mediated the efficacy of the self-help intervention on overall mental well-being, anxiety and depressive symptoms at 6 months.

Methods

Participants and procedure

Dutch participants aged ≥ 18 years with suboptimal mental health were recruited in The Netherlands in January 2014 via advertisements in national newspapers and in an online newsletter of a popular psychology magazine. Within three weeks, 518 eligible participants had registered for participating in the study and 455 of them had completed online informed consent and a screening questionnaire via an email notification (Figure 1). Participants were motivated to work on their mental well-being and resilience and they were willing to invest approximately 4 hours per week in the intervention program. At screening, 180 participants were excluded because they (1) were classified as having optimal (flourishing) mental health assessed with the Mental Health Continuum-Short Form (MHC-SF), (2) possessed moderate to severe anxiety or depressive symptoms as measured with the Hospital Anxiety and Depression Scale (HADS) (see outcome measures for details of these questionnaires) or (3) had an incomplete baseline assessment. The randomization procedure (stratified by gender and education) allocated the total sample of 275 participants to either the intervention condition or the wait-list control condition. Questionnaires were assessed at baseline (T0), at post-intervention 3 months after baseline (T1) and at follow-up 6 months (T2). Questionnaires were also assessed 12 months after baseline, but only in the intervention group because the control condition received the intervention after T2.

Figure 1. CONSORT Flow-chart of participants.

Intervention

Participants in the intervention condition received the self-help book “This is your life” in combination with email support. The book contains eight modules about six core processes derived from both overarching (Ryff, 1989; Seligman, 2011) and specific psychological and social theories (e.g. Neff, 2003a; see for full details Schotanus-Dijkstra, Drossaert, Pieterse, Walburg, & Bohlmeijer, 2015). The six core processes are positive emotion, discovering and using strengths (including flow), optimism and hope, self-compassion, resilience and positive relations. Each module (chapter) starts with a theoretical background and psycho-education. Then, 3-10 positive psychological exercises are provided per module. Alongside the book, participants also received a time-schedule of reading one module per week and practicing at least 2-3 recommended exercises of that module per week. Example of included activities are “three good things” (Seligman et al., 2005), “imagining a best possible self” (Peters, Flink, Boersma, & Linton, 2010), “writing a gratitude letter” (Seligman et al., 2005) and “active-constructive responding” (Gable, Reis, Impett, & Asher, 2004). Module 2 was spread out over 2 weeks because all five exercises were recommended and one of these exercises required feedback from their social network. Due to possible holidays and personal circumstances, the 9-week program could be extended up to a maximum of 12 weeks. A complete overview of the weekly program and recommended activities is published in our study protocol (Schotanus-Dijkstra et al., 2015).

To increase adherence, email support was added to the intervention. Participants in the intervention condition were encouraged to send one email per week to their personal counselor wherein they could write about their experiences with the topic and exercises of that week. It was also allowed to ask questions. Counselors were five senior positive psychology students of the University of Twente and the first author, all supervised by the author of the book and a clinical psychologist. The counselors were instructed to paraphrase upon participants’ individual experiences and to use positive reinforcement, empathy and stimulating questions (“Could it be helpful for you to practice this exercise more regularly?”) to keep the participants motivated for doing the weekly assignments according to the time schedule.

Participants allocated to the control group were placed on a wait-list for 6 months. After they completed the 6-months assessment, they received the self-help book “This is your life” by regular mail. Email support was not provided to this group. Participants in both conditions were allowed to use other health care services (usual care).

Outcome measures

Mental well-being was the primary outcome and measured with the 14-item MHC-SF (Keyes et al., 2008). This scale assesses emotional well-being (e.g. “In the past month, how often did you feel satisfied”), social well-being (e.g. “In the past month, how often did you feel that you had something important to contribute to society”) and psychological well-being (e.g. “In the past month, how often did you feel good at managing the responsibilities of your daily life”). On a continuous scale that runs from 0 (never) to 5 (almost always), higher total mean scores indicate higher levels of mental well-being. Participants were excluded from the current intervention when they were classified as having flourishing mental health, yielding scores of 4 or 5 on at least one emotional well-being item and at least 6 social and psychological well-being items (Keyes et al., 2008). The MHC-SF has shown good psychometric properties in diverse populations, including the general Dutch population (Lamers, Westerhof, Bohlmeijer, Klooster, & Keyes, 2011).

Anxiety and depressive symptoms were measured with the two subscales of the HADS, the HADS-A and HADS-D respectively (Zigmond & Snaith, 1983). Each subscale contains 7 items (e.g. “Worrying thoughts go through my mind” and “I can laugh and see the funny side of things”) with in each case different answer options, but all answered on a 4-point scale (0-3). Higher total summed scores on each subscale indicate higher levels of symptomatology. On this 0-21 scale, participants in the current study were excluded when they scored above 10 at baseline screening, indicating moderate to severe anxiety or depressive symptoms. The HADS yielded good psychometric properties in general population samples and clinical samples, including the general Dutch population (Spinhoven et al., 1997).

Mediator measures

Positive emotional states were measured with 8 items of the 16-item modified Differential Emotions Scale (m-DES) (Schaefer, Nils, Sanchez, & Philippot, 2010). The other 8 items measure negative emotional states which were not included in the current study. Participants indicated how each group of three positive emotions (e.g. “interested, concentrated, alert” or “joyful, amused, happy”) they experienced at the present moment on a 7-point scale (1=not at all, 7=very intense). Higher total mean scores indicate higher levels of positive emotional states. A slightly different version of this scale has been developed by Fredrickson and colleagues (2003), showing good internal reliability.

Use of strengths was assessed with the Strengths Use Scale (SUS), a 14-item scale with scores ranging from 1 (strongly disagree) to 7 (strongly agree) (Govindji & Linley, 2007). Higher total summed scores indicate more use of strengths in a variety of settings. The scale demonstrated good internal and test-retest reliability (Wood, Linley, Maltby, Kashdan, & Hurling, 2011).

The Life Orientation Test-Revised (LOT-R) was used to measure state optimism, which consists of 3 optimism items, 3 pessimism items and 4 filler items (Scheier, Carver, & Bridges, 1994). Item scores ranged from 0 (strongly disagree) to 4 (strongly agree). The total summed score is based on the optimism items and inversely coded pessimism items, which has been shown a reliable measure compared to only using the 3 optimistic items (Glaesmer et al., 2012). Higher scores indicate more optimistic expectations about the future.

Self-compassion was measured with the 12-item Self-Compassion Scale-Short Form (SCS-SF) with scores that range from 1 (rarely or never) to 7 (almost always). Higher total summed scores indicate higher levels of self-compassion. The short-form version has demonstrated good psychometric properties (Raes, Pommier, Neff, & Gucht, 2011), as has been found for the original version (Neff, 2003b).

The Brief Resilience Scale (BRS) assessed the level of resilience after stress and adversity, with higher scores indicating higher levels of resilience. The 6 items are scored on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Mean scores are calculated to obtain the total score. The scale yielded good psychometric properties (Smith et al., 2008).

Finally, positive relations was assessed with Ryff's Subscale of Positive Relations (SPR) (Ryff, 1989; van Dierendonck, 2011). We used the 9-item version of this scale, although 3-, 14- and 20-item versions are also available. Each item was scored on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). Higher total summed scores indicate higher levels of positive relations with others. The 9-item version has shown similar high internal reliability compared to the 14-item version and substantive higher reliability than the 3-item version (van Dierendonck, 2004).

Statistical analyses

Missing data on 3, 6 and 12 months were imputed using the expectation maximization (EM) algorithm (Dempster, Laird, & Rubin, 1977), to fulfill intention-to-treat criteria. Between-group differences were calculated up to 6 months follow-up because the control group received part of the intervention after this assessment. ANOVA-tests were used to examine the interaction effects of condition by time (2×3) on each outcome. *Post-hoc* bonferroni tests were used to reveal significant patterns of time. Cohen's *d* between group effect sizes and corresponding 95% confidence intervals (CI's) from T0-T1 and T0-T2 were calculated using SPSS scripts (Wuensch, 2012). Version 22.0 of SPSS (IBM, Chicago, Ill., USA) was used in all statistical analyses described here. In the intervention group, within-group differences between T1 and T3 were analyzed to examine whether the post-test results were maintained.

Mediation analyses were performed using the PROCESS tool (version 2.15) in SPSS, of which its macro was developed by Hayes (2012). Both simple and multiple mediation analyses were performed, including one mediator (simple) or all six mediators simultaneously (multiple). In our analyses, *X* is the condition (coded 1 for the intervention group and 0 for the control group), *Y* is the change in outcome measures from T0-T2 (mental well-being, anxiety symptoms or depressive symptoms) and *M* is the possible mechanism of change from T0 to T1 (increase in positive emotion, use of strengths, optimism, self-compassion, resilience and/or positive relations). We first performed analyses with the T0 outcome measure as covariate, to control for baseline variance in mental well-being, anxiety or depression. We had no reason to include other covariates because our prior study revealed no consistent moderator patterns (Schotanus-Dijkstra et al., Submitted-a). The covariates did not influence the results, therefore we report analyses without any covariates.

Unstandardized regression coefficients were calculated for each path in the mediation model using the PROCESS tool. Path *a* represents the effect of *X* on *M*, path *b* represents the effect of *M* on *Y* while statistically controlling for *X*, and path *c* represents the total effect of *X* on *Y*. The direct effect of *X* on *Y* while partialling out the effect of *M* is denoted as path *c'*. Then, the indirect effect of *X* on *Y* through *M* is calculated as the product of *a* and *b* (*ab*) of which the bias-corrected (BC) 95% CI's were based on 10,000 bootstrapped resamples (Hayes, 2013). When zero is not included in a BC 95% CI, it can be concluded with 95% confidence that the intervention effect on the outcome measure through a core well-being process is significant. In simple mediation, only one indirect effect is calculated and κ^2 is reported. Small, medium and large effect sizes correspond to

a κ^2 of .01, .09 and .25 respectively. In multiple mediation, specific indirect effects are calculated for each individual mediator, taken the correlation with the other mediators into account. The relative magnitude between the six mediators were examined with pairwise contrasts of the specific indirect effects. Significant differences between two specific contrasts are found when zero is included in a BC 95% CI.

Results

Repeated measures ANOVA showed significant time $\times$ group interaction effects on all six well-being processes (Table 1). These results indicate that the levels of positive emotion, use of strengths, optimism, self-compassion, resilience and positive relations were more increased in the intervention group compared to the wait-list group directly after the intervention and at follow-up. The *post-hoc* bonferonni tests demonstrated significant results for these measures between baseline and post-intervention and between baseline and follow-up, but not between post-intervention and follow-up. The latter non-significant relation indicates that the post-intervention results were maintained up to 6 months. An exception was found for resilience, of which all time-improvements (T0 to T1, T0 to T2 and T1 to T2) were significant, indicating that the level of resilience seems to have continuously increased. Cohen's *d* effect sizes were small to medium, except for self-compassion which showed large-sized effects between T0 and T1 ($d=.82$, 95% CI=.58-1.07) and between T0 and T2 ($d=.92$, 95% CI=.67-1.17). Within the intervention group, the effects at post-test were maintained up to 12 months or even further significantly improved on use of strengths [$t(136)=-3.33$, $p=.001$], self-compassion [$t(136)=-3.26$, $p=.001$] and resilience [$t(136)=-2.05$, $p=.043$].

Simple mediation models

The unique contribution of each core well-being process on the efficacy of the intervention was analyzed in simple mediation models. Table 2 shows the unstandardized regression coefficients on the change in mental well-being, and Table 3 shows these coefficients on the change in anxiety and depressive symptoms. All coefficients of the *a*-paths, *b*-paths and *c*-paths were significant. The coefficients for the direct effects (*c'*-path) of the intervention on T0-T2 change in depressive symptoms became non-significant when the T0-T1 change in self-compassion or positive relations was held constant (Table 3). More importantly, the BC 95% CIs of the indirect effects did not contain zero in any model, indicating that the effects of the intervention versus wait-list on mental well-being, anxiety and depressive symptoms were uniquely mediated

through positive emotions, use of strengths, optimism, self-compassion, resilience and positive relations. κ^2 effect sizes were mostly small [$\kappa^2=.02$ (BC 95% CI=.00-.06) to .08 (BC 95% CI=.04-.13)], except for self-compassion and positive relations showing moderate-sized effects [$\kappa^2=.09$ (BC 95% CI=.05-.15) to .14 (BC 95% CI=.08-.20)].

Multiple mediation models

In additional multiple mediation analyses, the core well-being processes were simultaneously entered in the regression models. Figure 2 shows that the change in positive relations from T0 to T1 is the only significant mediator of the relationship between intervention condition and change in mental well-being from T0 to T2. The BC 95% CI of the specific indirect effect of positive relations did not contain zero ($ab=-.10$, BC 95% CI=-.16 to -.05). In the multiple mediating model for anxiety symptoms (Figure 3), positive relations was also a significant mediator ($ab=.35$, BC 95% CI=.10 to .68) together with self-compassion ($ab=.38$, BC 95% CI=.06 to .78). Pairwise contrasts between the specific indirect effects of both mediators revealed a non-significant difference between these, indicating that self-compassion and positive relations equally mediated the relationship between the intervention effect and anxiety symptoms ($ab=.03$, BC 95% CI=-.45 to .56). For depressive symptoms (Figure 4), four mediators were found, namely positive emotions ($ab=.15$, BC 95% CI=.01 to .41), use of strengths ($ab=.17$, BC 95% CI=.01 to .45), self-compassion ($ab=.46$, BC 95% CI=.03 to .96) and positive relations ($ab=.54$, BC 95% CI=.22 to .94). The BC 95% CIs for the pairwise contrasts between all these mechanisms of change did contain zero and, therefore, indicate that change in positive emotions, use of strengths, self-compassion and positive relations simultaneously mediated the effect of the intervention versus wait-list on the change in depressive symptoms.

Table 1. Means and standard deviations for all well-being variables and results of the repeated measures analysis of variance and Cohen's *d* for between group effect sizes (email guided self-help intervention "This is your life" versus wait-list control), intention-to-treat analysis

	Guided self- help (<i>n</i> = 137) <i>M</i> (<i>SD</i>)	Wait-list control (<i>n</i> = 138) <i>M</i> (<i>SD</i>)	Interaction <i>F</i> ^b <i>p</i>		Effect size T0-T1 / T0-T2 <i>d</i> [95% CI]
Positive emotions(mDES)					
Baseline	3.56 (.74)	3.61 (.72)			
3 months	3.88 (.72)	3.60 (.71)			.37 [.13-.61]
6 months	4.03 (.91)	3.67 (.81)	7.37	.001	.40 [.16-.64]
12 months	3.82 (.80)				
Use of strengths (SUS)					
Baseline	62.42 (14.69)	63.12 (13.81)			
3 months	69.47 (13.99)	65.86 (14.56)			.38 [.14-.62]
6 months	69.70 (13.70)	66.14 (14.65)	7.15	.001	.37 [.13-.60]
12 months	72.20 (12.77) ^a				
Optimism (LOT-R)					
Baseline	13.86 (3.47)	13.78 (3.43)			
3 months	15.14 (3.41)	14.14 (3.24)			.32 [.09-.56]
6 months	15.37 (3.77)	14.00 (3.57)	8.25	<.001	.44 [.20-.68]
12 months	15.30 (3.60)				
Self-compassion (SCS-SF)					
Baseline	45.47 (10.05)	47.32 (10.08)			
3 months	52.82 (10.32)	47.92 (10.80)			.82 [.58-1.07]
6 months	54.06 (11.30)	47.93 (10.11)	42.01	<.001	.92 [.67-1.17]
12 months	55.03 (11.26) ^a				
Resilience (BRS)					
Baseline	2.84 (.63)	2.89 (.64)			
3 months	3.18 (.68)	2.89 (.67)			.67 [.43-.92]
6 months	3.26 (.72)	2.99 (.71)	19.59	<.001	.57 [.33-.81]
12 months	3.26 (.71) ^a				
Positive relations (SPR)					
Baseline	37.19 (7.18)	37.41 (6.96)			
3 months	40.37 (6.92)	37.58 (7.82)			.72 [.47-.96]
6 months	40.22 (7.11)	37.15 (7.37)	27.05	<.001	.72 [.48-.97]
12 months	40.61 (7.48)				

^a Significant within-group difference between T1 and T3 (*p* < .05).

Table 2. Simple mediation of the effects of the email guided self-help intervention (“This is your life”) versus wait-list control on the T0-T2 change score on mental well-being (MHC-SF), mediated by its working mechanisms (T0-T1).

Mediators T0-T1		<i>a</i>	<i>b</i>	Total effect <i>c</i>	Direct effect <i>c'</i>	Indirect effect <i>a*b</i> (95% CI) ¹	Effect size <i>k</i> ² (95% CI) ¹
mDES	Positive emotions	-.32**	.09*	-.50***	-.48***	-.03 (-.07, -.00)	.03 (.01, .06)
SUS	Use of strengths	-4.32**	.01***	-.50***	-.44***	-.06 (-.12, -.02)	.06 (.02, .10)
LOT-R	Optimism	-.91**	.05***	-.50***	-.46***	-.05 (-.10, -.01)	.04 (.01, .09)
SCS-SF	Self-compassion	-6.75***	.02***	-.50***	-.35***	-.15 (-.23, -.09)	.13 (.08, .19)
BRS	Resilience	-.33***	.27***	-.50***	-.41***	-.09 (-.16, -.04)	.08 (.04, .13)
SPR	Positive relations	-3.01***	.05***	-.50***	-.36***	-.14 (-.21, -.09)	.12 (.08, .18)

¹ Bias corrected bootstrap results for the indirect effect, number of resamples is 10 000.

* *p* < .05; ** *p* < .01; *** *p* < .001

Table 3. Simple mediation of the effects of the email guided self-help intervention (“This is your life”) versus wait-list control on the T0-T2 change score on anxiety (HADS-A) and depression (HADS-D), mediated by its working mechanisms (T0-T1).

Mediators T0-T1		<i>a</i>	<i>b</i>	Total effect <i>c</i>	Direct effect <i>c'</i>	Indirect effect <i>a*b</i> (95% CI) ¹	Effect size <i>k</i> ² (95% CI) ¹
Anxiety							
mDES	Positive emotions	-.32**	-.45*	1.65***	1.50***	.14 (.01, .38)	.02 (.00, .06)
SUS	Use of strengths	-4.32**	-.05***	1.65***	1.42***	.22 (.07, .50)	.04 (.01, .08)
LOT-R	Optimism	-.91**	-.22**	1.65***	1.44***	.20 (.05, .48)	.03 (.01, .08)
SCS-SF	Self-compassion	-6.75***	-.11***	1.65***	.94*	.71 (.40, 1.10)	.11 (.07, .17)
BRS	Resilience	-.33***	-1.18***	1.65***	1.25***	.39 (.15, .72)	.06 (.03, .11)
SPR	Positive relations	-3.01***	-.19***	1.65***	1.08***	.57 (.30, .95)	.09 (.05, .15)
Depression							
mDES	Positive emotions	-.32**	-.77**	1.52***	1.28**	.25 (.07, .56)	.04 (.01, .08)
SUS	Use of strengths	-4.32**	-.09***	1.52***	1.13**	.40 (.16, .75)	.06 (.02, .10)
LOT-R	Optimism	-.91**	-.26***	1.52***	1.28**	.24 (.07, .55)	.04 (.01, .08)
SCS-SF	Self-compassion	-6.75***	-.15***	1.52***	.54	.99 (.58, 1.49)	.14 (.08, .20)
BRS	Resilience	-.33***	-1.44***	1.52***	1.04*	.48 (.17, .92)	.07 (.02, .12)
SPR	Positive relations	-3.01***	-.27***	1.52***	.72	.80 (.45, 1.27)	.11 (.07, .17)

¹Bias corrected bootstrap results for the indirect effect, number of resamples is 10 000.

* *p* < .05; ** *p* < .01; *** *p* < .001

Figure 2. Multiple mediation of different well-being processes as mediators (T0-T1) of the intervention group versus wait-list group on mental well-being (T0-T2). Total effect (c-path) is given in parentheses. $^{**}p < .01$; $^{***}p < .001$; $^{\dagger}p < .10$

Figure 3. Multiple mediation of different well-being processes as mediators (T0-T1) of the intervention group versus wait-list group on anxiety symptoms (T0-T2). Total effect (c-path) is given in parentheses. * $p < .05$; ** $p < .01$; *** $p < .001$; † $p < .10$.

Figure 4. Multiple mediation of different well-being processes as mediators (T0-T1) of the intervention group versus wait-list group on depressive symptoms (T0-T2). Total effect (c path) is given in parentheses. $^*p < .05$; $^{**}p < .01$; $^{***}p < .001$ $p < .10$.

Discussion

This is one of the first studies that investigated possible mechanisms of change of a multicomponent PPI. This email guided self-help PPI has previously shown effective on mental well-being, anxiety and depressive symptoms (Schotanus-Dijkstra et al., Submitted-a) which was in line with earlier studies demonstrating the efficacy of guided cognitive behavioral therapy-based self-help programs on psychopathology and mental well-being (Cavanagh, Strauss, Forder, & Jones, 2014; Fledderus, Bohlmeijer, Pieterse, & Schreurs, 2012). The aim of the present study was to examine whether the email guided PPI was also effective in enhancing six core well-being processes (positive emotions, use of strengths, optimism, self-compassion, resilience and positive relations) and whether these improved processes mediated the effects on mental well-being, anxiety and depression.

Repeated measures analyses demonstrated that respondents from the intervention group improved significantly more on all these core well-being processes than the wait-list control group from baseline to 3 and 6 months. These effects were maintained or further improved within the intervention group up to 12 months. Large effect sizes were found for self-compassion, while the other well-being processes revealed small or moderate to large sized effects. Prior intervention studies have also revealed beneficial effects on these core well-being processes (e.g. Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Neff & Germer, 2013; Peters et al., 2010; Yu et al., 2015), although not all processes have been measured in one intervention study.

Results from series of single mediation analyses demonstrated that all processes emerged as mechanisms of change for establishing improvements on mental well-being, anxiety and depressive symptoms. The mediating role of self-compassion and positive relations were consistently stronger compared to the other well-being processes. When the six processes were included simultaneously in multiple mediation models, the mediating role of positive relations was most robust and pronounced. More specifically, the efficacy of the intervention on mental well-being was uniquely mediated through positive relations, the efficacy of the intervention on anxiety symptoms was mediated through positive relations and self-compassion, and the efficacy of the intervention on depressive symptoms was mediated through positive relations, self-compassion, use of strengths and positive emotions.

The differences in results between the single and multiple mediation analyses might reasonably be explained by intercorrelations between the six core well-being processes (Hayes, 2013). Therefore, a tenable conclusion seems to be that all six key-processes of the email guided self-help intervention mediated its efficacy on mental well-being, anxiety and depressive symptoms, but that positive relations (and self-compassion) did matter most. The role of these two processes in well-being interventions deserves some further discussion.

The importance of positive relationships for mental well-being has been underscored by different theoretical frameworks such as “the need to belong” (Baumeister & Leary, 1995) and the self-determination theory (Deci & Ryan, 2000). From an evolutionary perspective, people with strong social bonds and secure, loving and caring relationships survived and reproduced (Baumeister & Leary, 1995). However, the influence of positive relations on mental well-being has received little attention in scientific literature, while the influence of social support in times of negative life-events or the influence of dysfunctional relations on psychopathology is abundantly studied. Several empirical studies have shown that positive interrelationships function independently from negative interrelationships (Reis & Gable, 2003). To guide researchers interested in building positive relations, Reis and Gable (2003) proposed three main topics: intimacy, affection and shared fun. The prominent role of positive relations in the current study might be explained by the fact that these three topics were (almost) weekly targeted by specific and more transcendent exercises such as active-constructive responding to positive events, active listening, doing acts of kindness, keeping a diary of pleasant emotions and describe what happened with whom and visualizing your best possible self in the relational domain. Such activities might have strengthened specific social skills which may be a prerequisite for creating enduring positive relationships. Taken together, the role of positive relations seem of utmost importance in multicomponent PPIs and suggests that it is fruitful to strengthen it in various ways.

Self-compassion is the ability to be kind and non-judgmental to oneself and about others, especially when confronted with feelings or experiences of inadequacy, failure or suffering (Neff, 2003a; Neff, 2003b). The present study corroborates evidence about the strong positive relationship between self-compassion and well-being (Trompetter, de Kleine, & Bohlmeijer, 2016; Zessin, Dickhäuser, & Garbade, 2015) and the strong negative relationship between self-compassion and psychopathology (MacBeth & Gumley, 2012; Trompetter et al., 2016). Our findings also corroborated

earlier intervention studies that found support for the mediating role of self-compassion in mindfulness-based stress reduction (Keng, Smoski, Robins, Ekblad, & Brantley, 2012) and the value of self-compassion training in general (Fredrickson et al., 2008; Galante, Galante, Bekkers, & Gallacher, 2014; Jazaieri et al., 2012; Neff & Germer, 2013). A recent systematic review about compassion-focused therapy showed promising results on improving self-compassion and reducing depressive complaints, albeit very few RCT studies have yet been conducted (Leaviss & Uttley, 2015). The current findings suggest that self-compassion can be effectively cultivated when incorporated in a multicomponent email guided self-help intervention. Therefore, our study provides further support for the importance of fostering self-compassion in well-being interventions as a strategy to prevent mental disorders and promote optimal mental well-being.

Mental health care is confronted with increased burden of disease owing to depression and anxiety (Whiteford et al., 2013). A new strategy for the prevention of these mental disorders is to promote mental well-being (Forsman et al., 2015; Keyes, Dhingra, & Simoes, 2010; Kobau et al., 2011). A growing number of studies found that mental well-being may protect against the onset of mental disorders (Grant, Guille, & Sen, 2013; Keyes et al., 2010; Lamers, Westerhof, Glas, & Bohlmeijer, 2015; Schotanus-Dijkstra, ten Have, Lamers, de Graaf, & Bohlmeijer, 2016; Wood & Joseph, 2010). PPIs can be helpful by taking up social and societal roles again, for being kind to oneself and others and in strengthening those aspects that are needed for a fulfilling life. The present study underscores the importance of well-being interventions in the general population.

Strengths and limitations

This study was the first to examine the mediating role of six “building blocks” of a multicomponent PPI. Another major strength of the study was its experimental context, which provides stronger evidence compared to the bulk of correlational mediation analyses (Kazdin, 2009). Other strengths of the study were the large sample size for RCT-research and low attrition rate. Also, the statistical procedures used in the current study were based on the latest developments in the field of mediation analyses (Hayes, 2009; Kraemer et al., 2002; Preacher & Hayes, 2008), which contrasts to prior popular but insufficient techniques (Baron & Kenny, 1986).

Some limitations also apply to the current study, which should be considered when interpreting the results. First, the results emerged from a self-selected sample of

mainly middle-aged and higher educated women who were motivated to work on their well-being and resilience. Therefore, our findings are not generalizable to the general population. Future research should endeavor different recruitment strategies to attract more men and lower educated participants.

Second, the robust impact of positive relations in the current study might have been partially caused by the study design. Indeed, participants received email support from a personal counselor which could have directly influenced the assessment of positive relations. However, the SPR scale encompass items about family, friends and intimate relationships (e.g. “Most people see me as loving and affectionate”, “I enjoy personal and mutual conversations with family members or friends”) and the effect on positive relations was maintained up to 9 months after termination of the email correspondence with the counselor, indicating that it is unlikely that the answers on such questions have been affected by sole communication with a counselor. Furthermore, the topic of positive relations was mainly addressed in the final two chapters of the book, thus, participants who managed to complete these chapters could typify as fully adhered participants. Nevertheless, we have a strong reason to believe that this was not the case because our prior study found no significant dose-response relationship of adherence on mental well-being, anxiety and depressive symptoms (Schotanus-Dijkstra et al., Submitted-a).

Third, although experimental manipulation of potential mediators reveal strong evidence for causality testing, the temporal pathways remain unclear. Our data revealed significant improvements in both mediator and outcome measures at 3, 6 and 12 months. Hence, it remains unknown whether the change in well-being processes preceded the change in mental health outcomes or vice versa, or that a more bidirectional relation exist. At least, this study shows that the well-being processes covary with the outcome measures, indicating that these processes are important and might operate as mechanisms of change. To test the causal and temporal pathways more critically, more frequent assessment of possible mediators would be needed (Kraemer et al., 2002).

Finally, we cannot exclude the possibility that one or more unknown third variable have affected the direct and indirect effects of the intervention on outcome measures. Results of the multiple mediation analyses revealed total explained variances between 20% and 35%, suggesting much room for improvement. A next direction for research may be to include other known important processes such as mindfulness, hope,

goal-setting, expressive writing, basic psychological need satisfaction, catastrophizing, coping strategies and mastery.

We conclude that core well-being processes can be successfully promoted with a multicomponent PPI for people with suboptimal levels of mental well-being up to 12 months follow-up. Mediation analyses revealed that the intervention worked most effectively through improved positive relations and self-compassion. This implies that it seems fruitful and cost-effective to strengthen at least these two well-being processes in future self-help interventions aimed at improving mental well-being and preventing anxiety and depression. However, replication is necessary and other possible mechanisms of change underlying multicomponent PPIs should be unraveled in future studies.

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Chapter 9

Why people participate in online positive psychology counseling and who might benefit most? A mixed method approach

This chapter is submitted as:

Schotanus-Dijkstra, M., Drossaert, C. H. C., & Bohlmeijer, E. T. (*Submitted*). Why people participate in online positive psychology counseling and who might benefit most? A mixed method approach

Abstract

There is strong evidence that positive psychology interventions (PPIs) are effective in enhancing mental well-being and reducing depressive symptoms. However, there is a gap in the literature regarding the motives of people to seek positive counseling. The aim of this study is to qualitatively identify help-seeking motives and to quantitatively examine which motives relate to client satisfaction, adherence, mental well-being, anxiety and depressive symptoms. We analyzed 123 introductory emails of people with suboptimal levels of mental well-being who assigned to a comprehensive PPI of which its efficacy was investigated in a randomized controlled trial. Results showed that most people mentioned one or more motives related to (1) suffering (distress and stressful events/circumstances), (2) growth (mental well-being and protective factors) and (3) other motives (prior experiences with treatment, positive character of the program, having a coach, curiosity). When taking all motives of one person into account, almost 49% had only or predominantly suffering-related motives and 51% had only or predominantly growth-related motives. We found no significant correlations between motives and satisfaction, adherence to the program and treatment outcomes albeit protective factors and suffering were positively—though weak—correlated with adherence. The present study indicates that the comprehensive PPI with counseling had reached—and seemed successful for—a heterogeneous target group. This finding underscores the importance of implementing PPIs in public mental health and counseling practice because it can reach people who might be at risk for future mental disorders who otherwise might not seek help.

Introduction

In the last decades, a growing number of interventions have been developed to promote mental well-being in different non-clinical and clinical populations. The concept of mental well-being dates back from ancient times (Aristotle, 1925), although the current progress in empirical evidence and interest for mental well-being in clinical and counseling practice has emerged since the foundation of the positive psychology movement in the beginning of this century (Seligman & Csikszentmihalyi, 2000). The precise conceptualization of mental well-being is rather complex because there are many specific theories using different terminology (Huta & Waterman, 2013). However, it is now widely recognized that mental well-being comprises subjective well-being, psychological well-being and social well-being. Subjective well-being, also called emotional well-being, has been empirically defined by Diener (1984; Diener & Ryan, 2009) and consists of feelings of happiness, life-satisfaction and a positive-negative affect balance. Psychological and social well-being are theoretically defined and consist of aspects of positive individual functioning (Keyes, 1998; Ryff, 1989). Psychological well-being comprises self-acceptance, environmental mastery, positive relations, personal growth, autonomy and purpose in life (Ryff, 1989), and social well-being comprises social contribution, social integration, social actualization, social acceptance and social coherence (Keyes, 1998). In other words, subjective well-being mirrors “feeling good” (hedonia), while psychological and social well-being refer to “living well” (eudaimonia) (Deci & Ryan, 2006; Ryan & Deci, 2001).

The growing number of well-being enhancing interventions usually target aspects from positive psychology such as positive emotions, gratitude, self-compassion, personal growth and positive relations with others. The underlying aim of these so called positive psychology interventions (PPIs) is to reduce psychological distress and to prevent mood and anxiety disorders although their main aim is to increase positive feelings, cognitions and behaviors (Seligman & Csikszentmihalyi, 2000). Despite convincing evidence about the efficacy of PPI's on both enhancing mental well-being and alleviating depressive symptoms (e.g. Bolier et al., 2013b; Layous & Lyubomirsky, 2012; Sin & Lyubomirsky, 2009; Weiss, Westerhof, & Bohlmeijer, 2016), mainstream counseling and clinical practice still use cognitive-behavioral therapy (CBT)-based programs for reducing psychological distress. Research has shown that most people with symptoms of distress do not seek professional help (Andrews, Issakidis, & Carter, 2001; Mojtabai, Olfson, & Mechanic, 2002) because they prefer to self-manage distress (Thompson, Hunt, & Issakidis, 2004), but also because of a lack of willingness to self-disclose personal

thoughts and feelings (Vogel & Wester, 2003) or because of the stigma associated with mental health disorders (Vogel, Wade, & Hackler, 2007a). Positive psychology-based interventions have the potential to reach other types of clients than in traditional mental health services, for instance, because it might be less associated with stigma. PPIs could also attract clients who display a broad range of mental health problems and, therefore, seem to fit seamlessly on counseling practice (Lent, 2004). An understudied topic, however, is the motives of people to seek positive counseling and the implications of these motives for participants' engagement in the intervention and—in the end—for the efficacy of the intervention.

Well-being enhancing interventions: What is out there and who might search for it?

Thus far, the majority of scientific studies has focused on whether well-being enhancing interventions are effective in improving mental well-being and decreasing depressive symptoms (Bolier et al., 2013b; Layous & Lyubomirsky, 2012; Sin & Lyubomirsky, 2009; Weiss et al., 2016). Parks and colleagues (2012) were the first to examine the question “who are likely users of PPIs?”. They conducted a cross-sectional study with 912 “online happiness seekers”—people who were interested in participating in a one-week web-based positive psychology exercise. They received questionnaires to assess depressive symptoms and subjective well-being. Cluster analyses revealed two subgroups: (1) people who display severe depressive symptoms in combination with below average life-satisfaction scores (49.5% of the total sample) and (2) people who display average depressive symptoms and average life-satisfaction scores (50.5% of the total sample; Parks et al., 2012). These two different groups of “distressed” versus “non-distressed” people have recently been replicated through cluster analyses in two large samples ($n = 2384$ and $n = 2729$) of people who participated in a one or 3-week intervention of online positive psychology exercises (Sergeant & Mongrain, 2015). This study also revealed that the distressed cluster showed a larger decrease in depressive symptoms and a larger increase in life-satisfaction after completing the exercises at 1, 3 and 6 months than the non-distressed cluster. These studies showed that PPIs seem to attract a broad population, but they only measured psychological constructs with baseline data. To gain more insight into the reasons why people want to participate in a PPI, qualitative research seems necessary. To our knowledge, such qualitative research has not been done before. Also, the latter study could not compare their results to a placebo or wait-list control group and it might be that the distressed cluster had more room to grow than the non-distressed cluster.

Motives for participating in PPIs may influence participants engagement in the program. Non-adherence to online PPIs has shown to be a large problem (e.g. Bolier et al., 2013a; Schueller & Parks, 2012). Whereas the participants in the studies of Parks and colleagues (2012) and of Sergeant & Mongrain (2015) were instructed to practice only one exercise during the study period, more enduring effects on mental well-being and depression can be expected for comprehensive programs, especially when guided by a counselor (Andersson & Cuijpers, 2009; Fledderus, Bohlmeijer, Pieterse, & Schreurs, 2012; Pots et al., 2016). Comprehensive PPIs are often based on a theoretical framework and typically include psycho-education, numerous positive psychology-based exercises and involvement of a therapist or counselor, although a precise definition of a comprehensive or multicomponent PPI is currently lacking. Examples of effective comprehensive well-being programs are the 14-session “Positive psychotherapy” program (Rashid, 2014; Seligman, Rashid, & Parks, 2006) and a 10-session group positive psychology intervention (Chaves, Lopez-Gomez, Hervas, & Vazquez, 2016) for clinical populations, the 6-week “Working for wellness” group program for employees (Page & Vella-Brodrick, 2012), and the 9-week “This is your life” self-help program for the general public (Schotanus-Dijkstra et al., Submitted-a; Schotanus-Dijkstra, Drossaert, Pieterse, Walburg, & Bohlmeijer, 2015). Such intensive comprehensive programs require persistence to continue practice and a willingness to invest time. Hence, people seeking such programs seem to have a certain amount of motivation and need for help. However, the motives of users of comprehensive positive psychology-based programs and their relationship with treatment engagement and impact have not been studied yet. The current study will address these gaps in the literature.

Present study

The current study is based on a randomized controlled trial (RCT) of an email guided comprehensive positive psychology intervention for people with low or moderate levels of mental well-being recruited in the general population (Schotanus-Dijkstra et al., Submitted-a; Schotanus-Dijkstra et al., 2015). The aim of this study is to (1) qualitatively identify the motives of a self-selected sample of people who were interested in participating in the comprehensive self-help intervention, of which the motives were derived from introductory emails to their counselors, (2) to quantitatively examine which motives relate to client satisfaction and adherence to the program and (3) to quantitatively examine which motives relate to change scores in mental well-being, anxiety and depressive symptoms 3 and 6 months after baseline.

Method

Design

A mixed method approach is used wherein both qualitative and quantitative data are collected and analyzed of an intervention group who participated in an RCT of the early intervention aimed at enhancing mental well-being and flourishing mental health (Schotanus-Dijkstra et al., Submitted-a; Schotanus-Dijkstra et al., 2015). “This is your life” is a self-help book and consists of eight chapters covering six key components of mental well-being: positive emotion, discovering and using strengths, optimism and hope, self-compassion, resilience and positive relations. Each chapter contains psycho-education and a wide variety of positive psychology-based exercises. The chapters were spread out over 9 weeks in a time-schedule and the participants were encouraged to practice at least two of the exercises per chapter (see for more details our prior publications: Schotanus-Dijkstra et al., Submitted-a; Schotanus-Dijkstra et al., 2015). Participants could spend a maximum of 12 weeks on the program (taken holidays and personal circumstances into account) and received weekly personal email counseling during the weeks they had worked on the program.

In the current study, the introductory emails of participants to their personal counselor were qualitatively analyzed using content analysis to identify motives of people to participate in this positive psychology intervention. In addition, the main motives as revealed by the content analysis were quantitatively related to client satisfaction and adherence to the program, and to improvement in mental well-being, anxiety and depressive symptoms. Assessments took place at baseline (T0), at post-intervention, approximately 3 months after baseline (T1) and at follow-up, 6 months after baseline (T2). The RCT-study was approved by the Ethics Committee of the University of Twente (no. 13212) and registered in The Netherlands Trial Register (NTR4297). All participants gave online informed consent before participating in the study, including informed consent regarding the use of the email messages for scientific purposes.

Participants

Participants were recruited in The Netherlands by advertisements placed in national newspapers and in an online newsletter of a popular psychology magazine in January 2014. Eligible participants were self-selected adults of 18 years or older who were motivated to work on their well-being and resilience for approximately 4 hours per week.

Eligible participants had to have a valid email address and sufficient Internet connection for the email counseling and for filling out the online questionnaires. After registration, participants who gave online informed consent received a screening questionnaire to assess the level of mental well-being and the level of anxiety and depressive symptoms. Participants were excluded when they were classified as having flourishing mental health (i.e. combination of high levels of hedonic well-being and high levels of eudaimonic well-being) as measured with the Mental Health Continuum-Short Form (MHC-SF) and using the cut-off values for flourishing as proposed by Keyes (Keyes, 2006; Keyes et al., 2008). Participants were also excluded when they scored above 10 on either the anxiety or depression subscale of the Hospital Anxiety and Depression Scale (HADS), indicating moderate or severe symptoms (Spinhoven et al., 1997; Zigmond & Snaith, 1983). The recruitment strategy attracted many participants in a short amount of time, resulting in 518 participants who assigned to the program during three weeks recruitment. We excluded 35 people with flourishing mental health, 143 people with a HADS score >10 and 4 people who were both flourishing and had a HADS score >10 (Schotanus-Dijkstra et al., Submitted-a).

Of the eligible 346 participants, 275 participants completed the baseline questionnaire and were included in the RCT-study. 137 participants were randomly assigned to the intervention group who received the self-help book "This is your life" with email support from a counselor. The other 138 participants were randomly assigned to the wait-list control group who received the self-help book (without email counseling) after 6 months. The current sample consisted of 123 participants from the intervention group who had sent an introductory email to their personal counselor. The average age of the current sample was 48.6 years (SD = 11.04). They were mainly female (87.8%), higher educated (73.2%), married (43.1%), in paid employment (67.5%) and of Dutch nationality (89.4%). These characteristics are compatible with the total intervention group ($n = 137$) and the total sample ($n = 275$) of the RCT-study (Schotanus-Dijkstra et al., Submitted-a). All of the excluded participants ($n = 14$) had sent an email, but these emails did not contain any information of introducing oneself. Most of these participants just wanted to inform the counselor that they resigned from the program ($n = 9$). On average, these excluded messages consisted of 58 words (18-141 words).

Procedure

On February 12 2014, all participants in the intervention group received an email from their personal counselor. These counselors were five students of the Master Positive Psychology and Technology of the University of Twente who each guided 25 participants. The remaining participants were guided by the first author. In this first email, participants were warmly thanked for their participation in the study about resilience and well-being. The novice counselor introduced herself briefly (“My name is X. I am currently in the last phase of my study Psychology at the University of Twente. I am educated in positive psychology among other things and I hope that I can guide you in a good way”), mentioned that the participant could start reading the first chapter of the book, and explained the procedure of the email counseling. The introduction email ended with the following question: “Can you already send me a brief email next Sunday or Monday wherein you introduce yourself and write what you hope to achieve with this course?” The answer to this question in the first email of each participant was the basis for the content analysis.

Coding scheme

All email correspondence was anonymously saved in word documents per participant number, removing the opening (“Dear X”) and closing (“Greetings, X”) sentences. Other information that is traceable to the person was also removed, such as their own or family-member names, or their place of residence somewhere in the email. Of these introductory emails, the number of words was counted per email. Then, all unnecessary demographic information and technical issues were removed and long citations were shortened to obtain feasible fragments for coding direct motives (“My goal for this course is to ...”) and indirect motives (personal stories) for participating in the intervention, which from now on is referred to as “motives”. Of each participant, this adjusted introductory email was saved and uploaded as separate file in the software package Atlas.ti, version 7.

A conventional coding approach was used, meaning that the coding scheme was derived from the text (open or inductive coding) rather than theory (Hsieh & Shannon, 2005). Each email could contain multiple codes, but each code could only be assigned once to an introductory email of one participant. The first two authors independently read and coded 16 introductory emails to obtain a draft version of the coding scheme. This draft version was tested on 8 new introductory emails by independent coding, adjusted and then tested on another 8 introductory emails. Differences between both

raters were discussed until consensus was reached. This process was repeated until no new codes were found (saturation). The final coding scheme is presented in Table 1. In a second round of coding, two broad codes were further refined in separate coding schemes: “distress aspects” (Table 2) and “mental well-being aspects” (Table 3). At the end of the coding procedure of each email, we attempted to classify the overall impression of the participant into (1) only suffering, (2) predominantly suffering, (3) predominantly growth, and (4) only growth. The final schemes were used by the first author to code all introductory emails. 35% of these emails ($n = 43$) were also coded by the second author to test the inter-rater reliability. Cohen’s kappa was calculated and ranged from .68 for the overall impression to 1.00 for suffering and for mental well-being.

Quantitative measures

In this study, we used some quantitative measures from the T0, T1 and T2 assessments of the RCT. Client satisfaction was measured with the Client Satisfaction Questionnaire-short form (CSQ-8) (Attkisson & Zwick, 1982) which was completed at T1 (3 months). Answers are given on a 4-point scale with different answer options. Higher total mean scores indicate higher satisfaction with the offered intervention.

The number of sent emails and the self-reported number of completed modules were used as indicators of engagement (adherence) to the program. The latter was measured at T1 by asking the participants: “How much time did you spent on module ...[module 1-8]?” Answers were given on a 5 point scale for each module, that ranged from 1 (*no time spent*) to 5 (*spent a lot of time*). When participants spent *no time* (1) or *little time* (2) on a module, this was coded as not-completed.

We used the MHC-SF to measure mental well-being (Keyes et al., 2008) at baseline, 3 and 6 months, wherein subjective (emotional) well-being, psychological well-being and social well-being are integrated. Each of the 14-items were rated on a scale from 0 (*never*) to 5 (*(almost) always*) which slightly differs from its original scale that runs from 0 (*never*) to 5 (*every day*). Higher total mean scores indicate higher levels of mental well-being. The internal consistency at baseline was good ($\alpha = .88$), in agreement with prior validation studies (Keyes et al., 2008; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). To examine who benefited most from the intervention, the motives were related to the change scores (T0-T1 and T0-T2) on mental well-being.

Table 1. Coding scheme of introductory emails of individuals with low or moderate levels of mental well-being who participated in a comprehensive positive psychology intervention, and the number (*n*) and percentages (%) of participants who mentioned each (indirect) motive for participating.

Codes	Definition	Examples	<i>n</i> (%)
1. Suffering	Person suffers or has suffered from distress or mental disorders and/or from stressful events or circumstances.		109 (88.6)
A. Distress	See Table 2		93 (75.6)
B. Stressful event	Description or mentioning that an event or circumstance is or has been stressful.		75 (61.0)
Work	Stress from work, (a threatening of) job-loss, stress or loss from volunteer work.	"In times of stress and a hectic time at work, this leads to grumbling, complaining and overall negativity"	46 (37.4)
Family	Relational problems and divorce, loss of a loved one, caregiving to a relative, having a diseased relative (including ex-partner), new family composition, conflict with family member.	"The death of my older sister at the age of 29. In addition to the grief, this event also put my life upside down in practical terms"	34 (27.6)
Physical	Physical complaints or (chronic) diseases.	"A kind of deepest point was when they found two malignant tumors with me in a short amount of time"	22 (17.9)
Cumulative	A concatenation of different (prior coded) events with a great impact or there happened "a lot" without being specific.	"I've lost a lot in the past five years. Both my parents, three girlfriends, a dear sister in law and my work"	14 (11.4)
Transition	A transition in life (recent or upcoming retirement, becoming a parent, children living on their own) that is stressful, leads to a disoriented phase in their life or requires adaptability.	"Now that my youngest son also left our home, I feel a bit aimless, blue and miss the fun a lot. "Empty nest" is too simple I think."	9 (7.3)
Trauma in youth	A "traumatic" experience during childhood or adolescence.	"So I was an orphan, in an orphanage and in foster families"	6 (4.9)
2. Growth	A desire to grow, learn, understand or change.		113 (91.9)
A. Mental well-being	See Table 3		101 (82.1)
B. Protective factors	Factors that might be protective for one's mental well-being.		68 (55.3)
Hobbies	Person mentions one or more hobbies by way of introducing themselves which are per definition fulfilling.	"I have now more time for my hobbies walking and running"	37 (30.1)
Positive or resilient person	Person has generally a positive outlook which might now be lost or person has experienced resilience by coping effectively with negative life-events.	"I am a naturally positive person"	28 (22.8)

Enterprising	Volunteering that is satisfying or meaningful, or persons who are venturous and show that they have the ability and willingness to create new activities or ideas to change their situation.	"I find it rather difficult to go somewhere on my own. Yet I started yoga [...] and volunteering which I found very exciting but notice how good it makes me feel to have contacts with people"	18 (14.6)
Work satisfaction	Explicitly mentioning that their paid job is satisfying (sometimes in combination with work-related stress)	"I enjoy going to work every day"	17 (13.8)
Social support	Explicitly mentioning that they receive support from close friends or family	"My husband is very loving and was a great support"	7 (5.7)
3. Other motives	Other motives not related to suffering or growth.		56 (45.5)
Experiences with treatment	Someone who has experiences with prior treatments or interventions including mindfulness and self-help books		25 (20.3)
Positive/neutral	Prior treatment was (partly) successful, or the treatment is only mentioned without being judged.	"Later, a second psychologist crossed my path when I went to follow a mindfulness training, because of this my life got somewhat back on track"	21 (17.1)
Negative	Prior treatment was unsuccessful or did not fit the participant well enough.	"I am without therapy or something for a few years now [...] because I was not believing in it anymore and it became discouraging about what it gains"	5 (4.1)
Course-related			24 (19.5)
Coach	Participants mention that they are happy about receiving personal coaching (or to be "in the first group").	"Great that you will support me, I think that such guidance will help to really practice the exercises regularly"	14 (11.4)
Positive character	Explicitly mentioning that they were attracted by the advert or like positive psychology in general	"The call for this research appealed to me because of the terms 'resilience' and 'well-being'"	10 (8.1)
Curiosity	Curiosity about the program and what it can do for the person, or in relation to their profession (what it can do for their clients/employees)	"I was mainly curious about its content"	23 (18.7)
Scientific	Participant wants to help science or contribute to new insights about mental health of people	"Another reason to apply was that I have a warm heart for 'science'"	3 (2.4)

Table 2. Further refinement of the code “distress aspects” as (indirect) motive for participating in a comprehensive positive psychology intervention, and the number (*n*) and percentages (%) of participants with low or moderate levels of mental well-being who mentioned these motives in introductory emails.

1A. Distress	Definition	Examples	<i>n</i> (%)
Unhappy, negative or depressive feelings	Not able to enjoy life, feel blue, moody or grumpy, have a focus on the negative things in life, have (had) a depression or depressive feelings, feel vulnerable, useless or that “life goes by”, not able to cope with emotions.	“When I feel depressed, I focus even more on the negative and on my deficiencies and then this mood can stay for hours or days”	51 (41.5)
Feeling worried, restless or anxious	Rumination or worrying, not able to let worrying thoughts go, feel fearful.	“I hope to live less in my head, I can long linger in the things that keeps me busy”	29 (23.6)
Feeling tired or imbalance	Feeling tired or have a lack of energy sometimes because of sleeping problems, physical problems or being self-demanding, have (had) a burn-out or lost balance in life (mainly work-home balance), not able to relax.	“I am constantly looking for the right balance of the needs of my family, on my work (not now) and myself”	24 (19.5)
Low self-esteem, being self-critical or feeling insecure	Feel insecure, have a low or negative self-esteem, is (self)critical or self-demanding, has low self-acceptance and low self-care, feel vulnerable, not able to cope with criticism of others.	“And I would like to learn how I can make it less difficult for myself. I set the bar very high for myself and this has not always a positive effect on my”	23 (18.7)
Feeling lonely	Grief and mourning, not able to cope with emptiness, feeling or being alone, mainly through loss of a loved one, loss of work or ending a relationship.	“Now I feel often lonely and alone”	16 (13.0)
Other psychological problems	Having ADD, a cognitive disorder or “mental problems”, being sensitive for addiction, being highly intelligent.	“I was told by a neuropsychologist I am pretty damaged. I have a cognitive disorder [...] all the pieces fell into place why everything in my life was to stiff”	4 (3.3)

Table 3. Further refinement of the code “mental well-being aspects” as (indirect) motive for participating in a comprehensive positive psychology intervention, and the number (*n*) and percentages (%) of participants with low or moderate levels of mental well-being who mentioned these motives in introductory emails.

2A. Mental well-being	Definition	Examples	<i>n</i> (%)
Being more sensitive to positive things in life	Desire to feel more happy or satisfied in life, to enjoy or have fun in life, create a positive outlook or more optimism, keep a positive attitude, notice positive emotions or positive things in life.	“I hope to shift my attention more to the positive things in my life”	46 (37.4)
Being more mindful, relaxed and self-compassionate	Develop self-acceptance, find or notice inner peace, make life more simplistic, keep my balance, living in the moment, being more grateful, learn how to let things go, learn how to be loving, kind or happy with themselves.	“I would also like to deal with things easier and milder (but also with people, including myself) to accept it as it is”	44 (35.8)
Improving resilience to better cope with (future) adversity	Develop more resilience and well-being in life, positively respond to changes and adversity, find ways to cope better with adversity, prevent a new episode of a mental disorder.	“I am especially curious whether my positive outlook on life helps me to cope with adversity. Because these are there also of course”	30 (24.4)
Growing as a person and finding new meaning and purpose in life	Knowing themselves better, develop mentally, be myself, trust my own strengths, discover my strengths or passions and use these more, feeling purposeful, set new goals, give life meaning and content, living life to the fullest.	“I hope to get tools to come to myself, or at least find out for myself what I really want, I get energy from, what is really important for my happiness. I do not know this and therefore cannot work towards it.”	25 (20.3)
Improving relatedness	Be more of an inspiration to my environment, make more friends or have more contact with current friends, improve relation with spouse, develop positive relationships.	“What I expect from this course: that I get more grip on my own life and to life my life in connection with others”	10 (8.1)

Anxiety and depressive symptoms were measured at baseline and at 6 months, with the subscales of the HADS, the HADS-A and HADS-D respectively (Spinhoven et al., 1997; Zigmond & Snaith, 1983). Each subscale consists of 7 items with scores ranging from 0-3. Higher total summed scores (0-21) indicate higher symptom levels. The internal consistency was good ($\alpha = .76$ for both subscales), in agreement with prior validation studies (Bjelland, Dahl, Haug, & Neckelmann, 2002; Spinhoven et al., 1997). The change scores (T0-T2) were used to examine which motives were related to anxiety and depression.

Quantitative analyses

Missing data on the T1 and T2 outcome measures of the intervention group were imputed using the estimation maximization (EM) algorithm. We calculated the change scores in mental well-being, anxiety and depressive symptoms by subtracting the T0 score from the T1 or T2 score. Therefore, a positive change score on mental well-being means an increase in mental well-being over time and a negative change score on anxiety and depressive symptoms means a decrease in these symptoms. Each main code derived from the qualitative analysis was correlated with (1) number of words of the introductory email, (2) the T1 scores of client satisfaction and adherence, and (3) the change scores in mental well-being, anxiety and depression using Spearman's rho. The statistical analyses were performed using SPSS version 21.0 (IBM, Chicago, IL).

Results

The length of the introductory emails of the 123 participants varied greatly, from 58 words to 999 words ($M = 280$, $SD = 175$). Participants' motives could be divided into three overarching motives: suffering, desire for growth and other (Table 1). The first category, suffering, included both negative or distressed feelings as well as stressful events or circumstances. Distress feelings contained unhappy, negative or depressive feelings, but also having low self-esteem, being self-critical or feeling insecure (Table 2). Our analyses revealed that a large number of participants (89%) mentioned at least some suffering in their introductory emails. Sometimes the distress motive was highly related to stressful events or circumstances: *"The reason I am interested in your course is that more than a year ago, I had a burn-out after being employed for 40 years. In consultation with my employer I have decided to quit my job."* Most frequent subcategories were feeling unhappy, negative or depressive (42%), stress from work mainly due to a (threatening) of job loss (37%), family-related stress such as the loss of a loved one, relationship problems or taking care of a family member (28%), feeling worried, restless or anxious (24%) and feeling tired or imbalance (20%).

The second category, growth, consisted of motives related to mental well-being aspects and protective factors. Protective factors were also considered as growth because such factors might be beneficial for mental well-being (see Table 1). An overview of mental well-being aspects can be found in Table 3 and shows that these motives can vary widely, from more general (desire to feel more happy or improving "mental well-being and resilience") to more specific (give life new meaning or improving relationships). A large percentage of our participants mentioned one or more growth-related motives (92%) in their introductory email, of which the following subcategories were most frequent: having one or more hobbies (30%), a desire to be more sensitive to positive things in life (37%), being more mindful, relaxed and self-compassionate (36%), desire to improve their resilience to better cope with (future) adversity (24%) and being a positive or resilient person (23%).

The last category, "other", contains experiences with treatment (*"I have worked through the first book Living to the full in a group"*), course-related motives (*"I find it interesting to see whether the approach of positive psychology and the exercises can help me to stay more steady and more positive"*) and curiosity related motives which included professional curiosity (*"Personally but also from my profession as a return-to-work consultant I am very interested in the topic of developing resilience"*).

Based upon the raters' overall impression, participants were also divided into (1) only suffering (17%), (2) predominantly suffering (32%), (3) predominantly growth (38%) or (4) only growth (13%). Notably, it was sometimes difficult to distinguish between the predominant suffering or predominant growth motives. For example, both raters had individually coded the following introductory email and found agreement on all codes, except for the overall impression. One rater interpreted the overall motive of the participant as being predominantly suffering while the other rater coded the overall impression as being predominantly growth-related:

"Four years ago I already participated in a mindfulness course and I still benefit from it a lot. This new course seems a good way for me to go one step further. Life is sometimes not easy and I can use quite a bit more resilience. That will not only be good for me but also for the people around me."

Writing more words in the introductory email was significantly correlated with the overall impression as (predominantly) suffering (*Spearman's* $r = -.27$) and with its corresponding categories (suffering, feelings of distress and stressful events or circumstances, *Spearman's* r between .19 and .44). The number of words was also significantly and positively associated with protective factors (*Spearman's* $r = .36$) and other motives (*Spearman's* $r = .34$).

Who benefited most?

The overall impression of the introductory emails as well as the main motives were not significantly associated with client satisfaction or adherence to the program, nor with any changes in mental well-being or anxiety or depressive symptoms from baseline to 3 and 6 months (Table 4). The only two exceptions were found for the correlation between protective factors and number of completed modules, and between suffering and number of completed modules. However, both yielded small correlations of *Spearman's* $r = .20$ and $.19$ respectively. These results indicate that the intervention was effective for a heterogeneous group of participants who had low or moderate levels of mental well-being and had no more than mild anxiety or depressive symptoms at baseline.

Table 4. Spearman's rho correlations of motives with client satisfaction, adherence and change scores of mental well-being, anxiety and depressive symptoms of participants in a comprehensive positive psychology intervention.

	Number of emails	Number of completed modules	Client satisfaction	Mental well-being (T1-T0)	Mental well-being (T2-T0)	Anxiety symptoms (T2-T0)	Depressive symptoms (T2-T0)
Overall	-.03	-.08	-.03	-.16	-.08	.01	-.07
impression							
Suffering	.13	.19*	.10	.05	.02	-.14	-.05
Distress	.03	-.02	.10	.08	.00	.00	.06
Stressful events	.10	.15	-.04	-.02	-.07	-.16	-.11
Growth	.17	.12	.09	-.08	-.07	.02	-.10
Mental well-being	.08	.06	-.06	-.09	-.05	-.01	-.02
Protective factors	.07	.20*	.07	-.18	-.06	-.04	-.12
Other motives	.01	-.09	.05	-.12	-.04	-.04	-.04

* $p < .05$

Discussion

In this paper we explored the motives of users of a comprehensive positive psychology self-help intervention with email counseling. The content analyses of introductory emails sent by people with low or moderate levels of mental well-being to their personal counselors showed motives related to (1) suffering from feelings of distress (76%, e.g. negative mood, worrying, having low self-esteem) and suffering from stress related events or circumstances (61%, e.g. loss of work or relationship, taking care of a relative), (2) a desire to grow on mental well-being aspects (82%, e.g. being more sensitive to positive things in life, improving resilience to better cope with future adversity, being more self-compassionate) and having one or more protective factors (55% e.g. hobbies, being a resilient or positive person) and (3) other motives (46%, e.g. the positive character of the program, curiosity or positive experiences with prior treatments). Based on these different types of motives, we also classified people in one of four groups: people who mentioned only suffering motives (17%), people who mentioned predominantly suffering motives (32%), people who mentioned predominantly growth motives (38%) and people who mentioned only growth motives (13%). Almost none of these subgroups demonstrated significant more engagement in the intervention or significant more benefit. These findings indicate that people sought help for a great variety of reasons and provide further support for our prior finding that the comprehensive PPI was beneficial for a heterogeneous group of people (Schotanus-Dijkstra et al., Submitted-b).

Most people do not seek psychological treatment for symptoms of distress (Andrews et al., 2001; Mojtabai et al., 2002). The help-seeking process is complex and the final decision for seeking help (or not) will depend on the interplay between “approach” and “avoidance” factors (Vogel & Wester, 2003; Vogel, Wester, & Larson, 2007b). The current study focused on the reasons why people had assigned to the intervention (approach factors) and found somewhat similar reasons as has previously been found for seeking mental health services more in general. For instance, the level of suffering from distress and prior positive experiences with treatment seem important determinants of help-seeking behavior (Mojtabai et al., 2002; Vogel et al., 2007a; Vogel et al., 2007b) which were also present in the current study. Notably, concern about self-disclosure in counseling, and especially concern about emotional self-disclosure, have previously been found to be among the most important reasons *not* to seek help from a counselor (Vogel & Wester, 2003). We found in our study that most people were quite open in their first email to their counselor, suggesting that we mainly recruited people

who felt comfortable in self-disclosing personal information, including one's emotions. Although it could also be that the anonymous, online counseling facilitated openness.

Almost all of the identified subcategories of distress in the current study (Table 2) were also present in a list of 50 most frequently mentioned characteristics of a typical person (prototype) who seek help from a psychologist, as has been described by students (Hammer & Vogel, 2013). Interestingly, this list consists of mainly negative characteristics such as being stressed, unhappy, worried, indecisive, lonely or having low self-esteem. Contrarily, our study also revealed different growth motives, and moreover, participants who mentioned protective factors were more likely to complete a larger number of modules. This indicates that it may be beneficial for treatment adherence that counselors develop a sensitivity for gaining insight and utilize protective factors of their clients to keep them engaged in therapy.

People mentioned a large variety of growth motives as achievement goals for participating in the comprehensive PPI. For example, people mentioned that they wanted to change, develop and know themselves better, improve their resilience and to be more mindful and self-compassionate. To our knowledge, such growth motives for seeking treatment have not been systematically described in prior research. In fact, Hammer and Vogel (2013) argue that their list of unfavorable characteristics of a typical help-seeker might be an accurate prototype in counseling practice because *"if individuals are not stressed, struggling, and unhappy, they are unlikely to desire or require counseling"* (p. 91). However, the present results indicate that protective factors and growth motives might also be added to this list of characteristics of people searching for counseling.

The finding of our suffering and growth motives seems in agreement with a prior review described in this journal. Lent (2004) has argued that people who self-initiate counseling may have a hedonic well-being oriented help-seeking motive (*"desire for symptom relief and restoration of life-satisfaction"*) or a eudaimonic well-being oriented motive (*"desire for growth, learning, change or understanding"*). The former seems to mirror our suffering and stress-related motives, while the latter seems to mirror our growth motives. However, we interpreted the hedonic well-being motives somewhat differently. Most people did not seem to describe a clear desire to restore life-satisfaction because they formulated hedonic related motives more in positive developmental goals (*"I want to have more happy moments"*, *"I want to be more satisfied about the way I work"*) rather than an (indirect) motive for symptom relief (*"I feel unhappy"*). These findings indicate that suffering and growth motives seems distinguishable but do overlap on the boundaries

of each definition, at least in written text wherein no non-verbal cues are present and some interpretation depends on the researchers perspective.

Lent (2004) also believes that growth motives are probably not the initial motives with which people come into counseling practice, but may emerge when treatment is progressing. Yet, we found such motives already in the introductory emails which were sent before the start of the intervention. This might have been a consequence of the positive nature of the intervention or the positive formulated recruitment message. This might indicate that we were able to reach a broader target group: not merely the people who would eventually seek treatment because of increased suffering, but also those who want to grow to prevent symptoms of distress in the future. However, our study could only use data of those people who had participated in "This is your life". Future research should gain more insight in whether PPIs are indeed able to reach a broader target group in counseling practice compared to the more traditional CBT-based programs.

Strengths and limitations

Strengths of this study included the large sample size for RCT studies, the use of both qualitative and quantitative data and the broad and open question to participants about a personal introduction of themselves and their goals for the program, which seems to mirror a typical starting question in (online) counseling practice. In addition, the sample of mainly higher educated and middle-aged women seems a realistic target population of early interventions in public mental health and counseling practice because of our open recruitment approach in the general population. These sample characteristics are also in line with prior research (e.g. Bolier et al., 2013a; Gander, Proyer, Ruch, & Wyss, 2012; Parks et al., 2012). For future implementation, it is important to realize that a self-help book requires a certain level of reading ability. Also, the counseling via email required sufficient writing skills as well as the ability to give words to emotional feelings (Barak, Klein, & Proudfoot, 2009; Richards & Vigano, 2013). When researchers or practitioners want to reach less educated groups, more simplistic strategies are needed to reach these people through adjustment of the content and delivery of the intervention as well as in the recruitment strategy.

An important limitation of our study was that we could only examine the motives of the people who indeed participated in the intervention, mainly for several weeks. More research is needed to examine whether PPIs attract a broader target population than usual care. For example, people could be asked to respond on two drafts

of a recruitment message: one for a more traditional CBT-based intervention and one for a more PPI-based intervention. Who would choose which type of intervention and why? In addition, motives to seek such help as well as not to seek such help should be investigated.

Another limitation is that the frequencies of the motives derived from the content analyses, as well as its correlations with client satisfaction, adherence and treatment outcomes should be interpreted with some care. We found it sometimes difficult to make a distinction between subcategories within the main category and between the overall impression categories. The interrater reliability was adequate but not optimal, although discrepancies were solved by discussion after the calculation of kappa. Nevertheless, we recommend researchers to use both an open question about people's motives as well as a closed question to indicate one or more help-seeking motives at screening or after the first (online) counseling session. The categories of motives derived from our content analysis can be used to design the answer categories of closed questions.

A final limitation is that the participants' motives might have been colored a bit by the fact that they have written the introductory emails after they have received the self-help book. Also, their motives may have been influenced by the wordings used in the advert wherein people were recruited: (1) "Get the best out of yourself and improve your resilience and well-being with a free self-help course" or (2) "Become happy and stay happy? Improve your resilience and well-being with a free self-help course (Schotanus-Dijkstra et al., 2015). Some participants seemed to echo these recruitment messages, of which some persons mentioned this explicitly: *"What I hope to achieve is what the title harbors: that my mental resilience will increase and thereby also my well-being"*.

Practical implications and conclusions

Our study showed that the comprehensive PPI attracted a heterogeneous group of both people who are suffering as well as people who have a desire for growth. Moreover, the intervention was equally effective for both groups. This is important as it suggests that comprehensive PPIs have the potential to reach a larger group than traditional therapies. First, people who suffer, but who reject help because of stigma (Vogel et al., 2007a), may be willing to accept this form of help. Second, people who do not suffer may use this type of help to increase their resilience and mental well-being, and prevent future psychiatric morbidity (Keyes, Dhingra, & Simoes, 2010; Schotanus-Dijkstra, ten Have, Lamers, de

Graaf, & Bohlmeijer, 2016). Therefore, our study is of importance from a public health point of view as well as for counseling practice. An interesting direction for future research might concern who prefer PPI-based interventions and who prefer CBT-based interventions, and is preference for certain types of interventions related to better mental health outcomes? In this regard it is interesting to note that there are some tentative indications that PPIs and CBT programs work equally well in decreasing depressive symptoms (Chaves et al., 2016; Parks & Szanto, 2013).

Another direction for future research may lie in automatic text coding, which is expanding in the literature. Our study consisted of 123 emails which was a good amount to handle by human coding. However, email counseling has previously been added to other types of psychological interventions as well (Fledderus et al., 2012; Holländare et al., 2016; Paxling et al., 2013; Pots et al., 2016; Svartvatten, Segerlund, Dennhag, Andersson, & Carlbring, 2015). To be able to compare email counseling in different interventions and/or different study populations, automatic text coding of such large amounts of text data might be beneficial. Different text processing methods and text visualization methods exist, such as streamgraphs (Wiegersma, Sools, & Veldkamp, Internal document) using a popular software program for text analyses (Linguistic Inquiry and Word Count or LIWC), and word clouds analysis (McNaught & Lam, 2010). However, these methods or programs only detect single words rather than its context (Tausczik & Pennebaker, 2010). This might be a problem in the type of study that we did because the word “happy” would be coded as a positive emotion in both of the following sentences: *“What I want to achieve is to be more happy”* and *“though there are days that you do not feel happy because of various circumstances”*. We interpreted the former as a desire to be more positive in life and the latter as feeling unhappy, negative or depressive mood. Developing systems to detect emotional language within its context seems a challenge for future researchers.

To conclude, our study suggests that people who described only or predominantly growth motives engaged and benefited just as much from the early intervention as people who described only or predominantly suffering motives. More importantly, we did not find indications that certain subgroups of people got worse from working on improving positive emotions, strengths, optimism, self-compassion, resilience and positive relations. The current study provides further support for the notion that PPIs can reach a large and broad target group and might be of great importance for public mental health and counseling practice to prevent the onset of symptoms of distress or a worsening of complaints.

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Chapter 10

General Discussion

General discussion

There is a rapidly growing interest in enhancing mental well-being in public mental health (Kobau et al., 2011), clinical psychology (Wood & Tarrier, 2010) and clinical psychiatry (Jeste, Palmer, Rettew, & Boardman, 2015). This seems a result of the foundation of positive psychology in 2000 whereby the focus on the “negative” is now reinforced by a focus on the “positive” (Seligman & Csikszentmihalyi, 2000). Since World War II, psychologists predominantly endeavor to repair weaknesses, create symptom relief and “cure” mental disorders (disease model). Contrarily, positive psychologists endeavor to build thriving individuals, to prevent worsening of symptoms and to work on the strengths of people with a mental illness (strengths-based model).

Research has indicated that a high level of mental well-being seems both a desirable end in itself and might protect against the onset of mental disorders (Keyes, 2002; Keyes, Dhingra, & Simoes, 2010; Lamers, Westerhof, Glas, & Bohlmeijer, 2015). The most optimal level of mental well-being is known as flourishing mental health, defined as having high levels of both hedonic well-being (e.g. emotional well-being) and eudaimonic well-being (social- and psychological well-being) (Hone, Jarden, Schofield, & Duncan, 2014; Huppert & So, 2013; Keyes, 2002). Enhancing flourishing mental health seems an important goal for public mental health and clinical practice, but scientific research about the importance of this optimal mental health status is scant. The aim of this thesis was to examine flourishing mental health in The Netherlands with epidemiological and intervention research. The two main goals were:

- (1) What characterizes people with flourishing mental health? How many people are flourishing in the general population in The Netherlands, what characterizes them and does this status reduce the risk of developing mental disorders?
- (2) Can flourishing be effectively enhanced through the use of a multicomponent well-being intervention? Is the intervention cost-effective, how does the intervention work, who is searching for this type of intervention and who benefited most of it?

In this chapter, I will start by a short reflection upon the theoretical frameworks of flourishing mental health. Next, I will provide an overview of the main findings of this thesis and discuss its central goals. Then, the strengths and limitations of the studies are summarized and discussed. This general discussion will end with implications for future research and practice.

Theoretical frameworks of flourishing mental health

In the literature, no clear definition exists of mental well-being, although attempts have been made to reduce the complexity of this concept in a simple and universal definition (Dodge, Daly, Huyton, & Sanders, 2012). Hence, theoretical frameworks of mental well-being and flourishing mental health mainly describe specific aspects of well-being rather than a definition (Dodge et al., 2012). In the general introduction, I presented three main theoretical frameworks of flourishing mental health: the human needs theory (Deci & Ryan, 2000; Maslow, 1943), the positive mental health framework (Keyes, 2002; Keyes, 2007) and the PERMA model (Seligman, 2011). Each of these frameworks are accompanied by an instrument, respectively the Basic Need Satisfaction Scale (BNS) of which the Basic Need Satisfaction at Work Scale is the most validated and popular version (SDT, 2016), the Mental Health Continuum-Short Form (MHC-SF) (Keyes et al., 2008; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011) which was derived from items of a large representative study about mental health in the USA (Keyes, 2002; Keyes, 2005), and the PERMA-profiler (Butler & Kern, 2015) which has rarely been used in empirical research (Hone et al., 2014). Some other instruments have also been developed to measure (optimal levels of) mental well-being, which are not directly based upon a theoretical framework. These include Huppert and So's framework of flourishing (2013), the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) (Tennant et al., 2007) and the Flourishing Scale (Diener et al., 2009).

As I stated in the general introduction, flourishing mental health is defined as **having high levels of both hedonic and eudaimonic well-being aspects**. All the above mentioned instruments measure aspects of hedonia (emotional well-being) and eudaimonia (psychological well-being), except for the BNS and Flourishing Scale which measure merely eudaimonia (i.e. psychological well-being). Furthermore, the MHC-SF is the only instrument that also assesses how well people function in the community and society, in other words, the level of social well-being. Although "positive relations" is a core component in the three theoretical frameworks of flourishing mental health and included in each instrument, this is a theoretical indicator of psychological well-being rather than social well-being (Ryff, 1989; Weiss, Westerhof, & Bohlmeijer, 2016).

Keyes (2005, 2006, 2007; Keyes et al., 2008) is also the first scientist who has operationalized how "high" the levels of hedonic and eudaimonic well-being should be in order to be classified as "flourisher". His definition is somewhat arbitrary although he based his ideas on how the presence (and absence) of a major depressive episode was defined in the DSM-III-R (Keyes, 2005). Huppert and So's framework (2013) also uses a

classification system to operationalize flourishing mental health, but this framework seems less influential than the framework of Keyes. This might have been caused by (1) the unidimensional approach of mental health which is disputed by many positive psychologists and (2) the difficulty to implement the associated instrument in empirical research. In a first step, Huppert and So (2013) identified “symptoms” of flourishing by taking the opposite symptoms of generalized anxiety disorder and major depression (e.g. “fatigue or loss of energy” became “vitality”, and “significant difficulty in controlling anxiety and worry” became “resilience”). This approach is somewhat in conflict with the two continua model of mental health wherein mental well-being and mental illness are perceived as two different dimensions of mental health—although these dimensions are related (Lamers et al., 2015; Westerhof & Keyes, 2010). In a second step, Huppert and So (2013) selected items from an existing large epidemiological survey to measure each symptom of flourishing which has led to different answer categories for most items and to different (data-driven) cut-off values for classifying people with the highest level of each symptom (Huppert & So, 2013). Despite these shortcomings, their research showed large differences in the level of flourishing mental health between European nations (Huppert & So, 2013), of which The Netherlands scored around the average. Huppert and So’s framework can also be used for a further refinement of the definition and operationalization of flourishing mental health in the future. Although the definition of flourishing seems clear at first sight, it is yet unclear what constitutes “mental well-being” and how “high” this level must be to consider one as being flourishing.

Taken together, the positive mental health framework was most prominent in this thesis because it seemed the most comprehensive and well-founded theory available, including social functioning in society and clear—though arbitrary—cut-off values for the highest levels of mental well-being.

Main findings

What characterizes people with flourishing mental health?

The second wave (2010-2012) of the representative Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2) among 5303 Dutch people showed that 36.5% of them possessed flourishing mental health (*Chapter 2*). This prevalence of flourishing is comparable to the prevalence of flourishing in New Zealand (39%), which was also measured with the MHC-SF (Hone et al., 2014). These prevalence rates seem high, especially when compared to a representative sample in the USA (18%; Keyes, 2002) albeit the latter study used the long form version of the MHC. Our study also revealed

that there is room for improvement on the level of eudaimonic well-being and flourishing. For example, much higher rates of flourishing mental health are found in large student samples, namely 51.8% and 69.1% in the USA (Keyes et al., 2012; Low, 2011) and 72.8% in Tanzania (Rugira, Nienaber, & Wissing, 2013). An exception was found in a study among South African University students which showed only 22.2% flourishers (Van Zyl & Rothmann, 2012). Nevertheless, these studies suggest that it is worthwhile to examine whether it is possible to enhance flourishing mental health in different target populations.

In our study, flourishing mental health was significantly associated with personality traits (higher conscientiousness and extraversion and lower neuroticism), higher education, female gender and younger age. Also, we were the first to show that flourishing was significantly related with more perceived social support and more positive life-events, while no significant relations were found for having negative life-events or physical health status (*Chapter 2*). These findings are in agreement with prior studies, suggesting that personality traits, higher educational attainment and social support seem robust but relatively small correlates of higher levels of mental well-being (Demir & Weitekamp, 2006; Keyes & Simoes, 2012; Lamers, Westerhof, Kovács, & Bohlmeijer, 2012; Ryff, 2014). In contrast, the association of mental well-being with gender and age varies greatly in these studies when compared to our results. For example, Keyes and Simoes (2012) found more flourishing mental health in male and older age groups, while we found more flourishing mental health in female and younger age groups. In both Dutch samples, Lamers and colleagues (Lamers et al., 2012) found a significant relation between lower age and higher mental well-being and no significant relation between gender and mental well-being, while we found no significant relation between age and flourishing and a significant relation between female gender and flourishing mental health. However, the role of gender and age seems limited because these variables also contributed little to the total explained variance of flourishing mental health.

In this first study about flourishing mental health in The Netherlands, we included characteristics that correspond to two of the three major determinants of the model of sustainable happiness: the genetic set point (e.g. personality traits) and personal circumstances (i.e. demographics, life-events) (Lyubomirsky, Sheldon, & Schkade, 2005; Sheldon & Lyubomirsky, 2006). However, the third determinant of this model—intentional activities, which can be behavioral, cognitive or volitional—seems to be of utmost importance for public mental health and clinical practice because this

determinant can be influenced by intervening and taking action (Lyubomirsky et al., 2005; Sheldon & Lyubomirsky, 2006). Based on our results, it seems interesting for future studies to determine whether creating and maintaining a supportive network, savoring positive life-events, and learning conscientious behavior like goal-setting and finding an ambition or passion might be valuable ingredients in mental health promotion activities to achieve enduring flourishing mental health.

Why is flourishing important?

There seems room for improvement on the prevalence of flourishing in The Netherlands and other countries (Hone et al., 2014; Huppert & So, 2013; Keyes, 2002), but why should governments pursue a flourishing life for all citizens? To answer this question, we carried out a follow-up study using the second wave (2010-2012) and third wave (2013-2015) of the NEMESIS-2 data of individuals who had no mental disorder 12 months prior to the second wave ($n = 4482$). Results demonstrated that flourishing mental health, as well as high hedonic well-being and high eudaimonic well-being, significantly predicted first-onset and recurrent incident DSM-IV mood disorders (reduced risk between 48% and 25%) and anxiety disorders (reduced risk between 53% and 46%) three years later, but not substance use disorders (*Chapter 3*). When the covariates “social support” and “positive life-events” were removed from the regression analyses—the two variables that correlated significantly but only weak with flourishing, as was also found in *Chapter 2*—flourishing, high hedonic and high eudaimonic well-being significantly reduced the risk of developing any substance use disorder (between 38% and 32%) three years later. However, 95% confidence intervals were large and more studies are needed to examine the longitudinal relationship between mental well-being and substance use disorders.

We were the first to assess the longitudinal relationship between flourishing mental health and a broader range of mood and anxiety disorders, as well as with any substance use disorder compared to a prior study using a valid and extensive diagnostic instrument to assess DSM-IV disorders (Keyes et al., 2010). Another strength of our study was that we also showed the longitudinal relationship between either high hedonic well-being or high eudaimonic well-being and mental disorders. To date, four prior studies had investigated the longitudinal relationship between mental well-being and psychopathology (Grant, Guille, & Sen, 2013; Keyes et al., 2010; Lamers et al., 2015; Wood & Joseph, 2010), of which two had also used a representative population sample (Keyes et al., 2010; Lamers et al., 2015). These four studies, and our study, all concluded that a

higher level of mental well-being is longitudinally related to a lower level of mental illness.

Notably, our study found the highest reduced risk for developing anxiety disorders (53% versus 28% for mood disorders), suggesting that well-being-enhancing interventions might also be efficacious in preventing or reducing anxiety symptoms. To date, the majority of such interventions have focused merely on non-clinical samples or individuals with depressive symptomatology. Besides assessing mental well-being, such studies mainly assessed depressive symptoms rather than anxiety symptoms (Bolier et al., 2013b; Sin & Lyubomirsky, 2009). Overall, our findings corroborate the “mental health promotion and protection hypothesis”. This hypothesis suggests that mental well-being should be *promoted* and a flourishing mental health status should be *protected* because flourishing reduces the risk of future mental disorders, whether you achieve a flourishing status or maintain it (Keyes, 2007; Keyes et al., 2010). Thus, governments, public mental health and mental health services have good reason to promote mental well-being in the general population, and should expand hedonic well-being measures with eudaimonic well-being measures to be able to measure flourishing mental health (Forgeard, Jayawickreme, Kern, & Seligman, 2011).

How should flourishing be measured?

In the NEMESIS-2 study, flourishing was measured with the Mental Health Continuum-Short Form (MHC-SF). This 14-item questionnaire is theoretically driven, widely used in empirical research and also translated and validated in Dutch language (Keyes et al., 2008; Lamers et al., 2011). A detailed description of this scale can be found in the general introduction (*Chapter 1*). A few other instruments also aim to measure flourishing mental health. These are the Flourishing Scale (Diener et al., 2009), Huppert and So’s framework (2013) and the PERMA-profiler (see Hone et al., 2014). The latter two have not yet been validated and are rarely used in empirical research as mentioned earlier. Contrarily, the Flourishing Scale has been translated and validated in different languages and demonstrated good psychometric properties (Diener et al., 2009; Hone, Jarden, & Schofield, 2013; Howell & Buro, 2014; Silva & Caetano, 2011; Sumi, 2013; Tang, Duan, Wang, & Liu, 2014). To validate the Dutch version of the Flourishing Scale, we added this scale to a set of questionnaires in the randomized controlled trial (RCT) about a multicomponent well-being intervention which we have described in *Chapter 4*.

In *Chapter 5*, we showed that the Flourishing Scale was a reliable and valid tool to measure social-psychological functioning in people with low or moderate levels of mental well-being. However, we also found positive skewness of the scale, limited external validity and insufficient measurement precision at the higher end of the social-psychological continuum. Moreover, the name “Flourishing Scale” seems somewhat misleading because the scale does not include items to measure hedonic well-being, a prerequisite of having flourishing mental health (Hone et al., 2014; Huppert & So, 2013; Keyes, 2002). Therefore, the Flourishing Scale seems most appropriate for use in epidemiological studies wherein a hedonic measure is already present. The data of our validation study indicate that the Flourishing Scale is less suitable for use in intervention studies. This was confirmed in our RCT-study because the Flourishing Scale was the only measure that did not differ significantly between the intervention group and control group. This might be explained by the positive skewness at baseline, leaving not much room to grow on social-psychological functioning during and after the intervention.

Can flourishing be (cost-)effectively enhanced?

The first well-being intervention described in the literature was Fordyce’s happiness program which consisted of fourteen strategies based on characteristics of happy people, such as “spend more time socializing”, “lower expectations and aspirations” and “become involved with meaningful work” (Fordyce, 1977). This intervention showed promising results in different student samples, with beneficial effects on happiness for those who participated in each variant of the program (Fordyce, 1977, 1983). Other studies have shown beneficial effects on a gathering of different positive psychology exercises, for example in online self-help seeking participants (Schueller & Parks, 2012) and even in suicidal inpatients (Huffman et al., 2014). However, more enduring effects on mental well-being as well as psychopathology have been found for comprehensive programs which are based on one or more theoretical frameworks and on empirical evidence, typically including psycho-education, numerous positive psychology-based exercises and involvement of a therapist or counselor. Examples of such effective multicomponent well-being programs are the 14-session “Positive psychotherapy” program (Rashid, 2014; Seligman, Rashid, & Parks, 2006), a 10-session group positive psychology intervention (Chaves, Lopez-Gomez, Hervas, & Vazquez, 2016) and the 6-week “Working for wellness” group program (Page & Vella-Brodrick, 2012). The first two programs were developed for and tested in clinical populations and the third program was developed for and tested in an employee sample. However, these programs were not designed neither evaluated to increase mental well-being up to a

flourishing mental health status. Also, these programs were delivered face-to-face and required skilled trainers (i.e. licensed and experienced psychologists). Therefore, efficacy studies reached relatively few participants when compared to (web-based) self-help programs with no (Bolier et al., 2013a) or some therapeutic guidance (Fledderus, Bohlmeijer, Pieterse, & Schreurs, 2012; Pots et al., 2016). Notably, the guided programs showed larger effect sizes than the non-guided program in accordance with meta-analytic findings (Andersson & Cuijpers, 2009).

In Part II of this thesis, we described and examined the effectiveness of a Dutch self-help program called “This is your life” which was specifically designed to stimulate and achieve optimal levels of mental well-being. This 9-week program consists of a self-help book (psychoeducation and numerous positive psychology-based exercises) and email support from a counselor and is developed for and examined in people with low or moderate levels of mental well-being. These people seem more susceptible of developing mental disorders in the future than people with flourishing mental health, as we have shown in Part I of this thesis. Our RCT (*Chapter 6*) revealed that participants in the intervention group had improved significantly more on mental well-being compared to the wait-list control group. Importantly, the levels of mental well-being were improved from low or moderate levels of mental well-being to flourishing mental health for 30% of the participants in the intervention group at post-test and 34% at 12 months follow-up. This was a significantly higher proportion of flourishers compared to the proportion of flourishers in the control group (12%).

The RCT-study also revealed significant results on anxiety and depressive symptoms in favor of the intervention group (*Chapter 6*), and on positive emotions, use of strengths, optimism, self-compassion, resilience and positive relations (*Chapter 8*). The significant results were maintained up to at least 6 months after baseline. The largest effect sizes (of large magnitude) were found for mental well-being ($d = 0.89$ to 0.93) and self-compassion ($d = 0.82$ to 0.92). Moderate to large effect sizes ($d = 0.56$ to 0.72) were found for anxiety symptoms, resilience and positive relations. The other significant effect sizes were small to moderate ($d = 0.32$ to 0.45). The wait-list control group had received the self-help book after 6 months assessment. Therefore, we could only analyze within-group differences of the intervention group at 12 months. These analyses revealed that the significant results at post-test were maintained up to 12 months, or improved even further for self-compassion and resilience.

Finally, in *Chapter 7* we demonstrated the cost-effectiveness of “This is your life” in people with low or moderate levels of mental well-being at 6 months. The outcomes were flourishing (versus non-flourishing) and a treatment response on anxiety and depressive symptom severity as defined by a reliable change using the Jacobson and Truax-method (Jacobson & Truax, 1991). The cost-effectiveness analysis (CEA) was conducted from a health care perspective which included direct medical and non-medical costs (i.e. the costs of health service use and travel costs to these services) and the intervention costs. The intervention costs were probably the main drivers of the somewhat higher health care costs at 6 months in the intervention group. The scatterplot in the cost-effectiveness plane showed that the intervention has led to more flourishers and more treatment responders at low additional costs when compared to usual care (participants in both conditions were allowed to seek other forms of help). The cost-effectiveness of “This is your life” was further supported by the different sensitivity analyses wherein the intervention costs were adjusted upwards and downwards and wherein only completed data were used. When policy-makers and governments are willing to pay around €8000 per treatment response, there is an 80% probability that the intervention is more cost-effective relative to usual care.

This study was the second CEA conducted so far about a positive psychology-based intervention and showed promising results for large-scale implementation of this type of intervention in public mental health. The prior CEA was about an unguided online positive psychology-based intervention for participants with mild to moderate depressive symptoms. This intervention seemed not cost-effective on mental well-being and depression, but was conducted from a societal perspective and had to deal with some outliers on productivity costs and low adherence to the intervention (Bolier et al., 2014), limiting direct comparison of results.

Taken together, we can conclude that it is possible to enhance flourishing in people with low or moderate levels of mental well-being who may have had mild anxiety or depressive symptomatology, by participating in the multicomponent well-being intervention “This is your life” with email support. The recruitment strategy in the general population yielded a majority of higher educated and middle-aged women, which is a representative sample for implementing self-help interventions in The Netherlands, although not representative for the general Dutch population. The intervention was also cost-effective in ameliorating flourishing and treatment response in anxiety and depressive symptom severity, especially when there is some willingness

to pay. Furthermore, our results demonstrated that the intervention was highly effective in improving self-compassion and positive relations.

Why was the intervention effective in promoting mental well-being and reducing anxiety and depressive symptoms?

There is convincing evidence about the efficacy of positive psychology exercises as well as of multicomponent well-being interventions. However, little is known about why such interventions work. In *Chapter 8*, we described single and multiple mediation models to examine the working mechanisms of the multicomponent program “This is your life” with email support. The baseline to 6 months change scores (T0-T2) on mental well-being (as a continuous scale), anxiety and depressive symptoms were the outcome variables in these models, and the baseline to 3 months change scores (T0-T1) on the six key well-being processes (positive emotions, use of strengths, optimism, self-compassion, resilience and positive relations) were the possible mediators. Results of the single mediation models revealed significant results for all six well-being processes. The multiple mediation models revealed significant results for positive relationships in all three models, for self-compassion in two models (anxiety and depressive symptoms as outcome variables) and for positive emotions and use of strengths in one model (depressive symptoms as outcome variable).

According to Hayes (2013), both single and multiple analyses provide useful insights about possible mechanism of change. He argues that ambiguous conclusions between the two types of analysis do not justify any elimination of results. For example, optimism and positive relations were both significant mediators in the single mediation models of our study wherein other—possibly intercorrelated—well-being variables were excluded. When including all six well-being processes in one model, it turned out that positive relations remained a significant mediator while optimism did not. It might be tempting to conclude that the latter finding is correct, but by including multiple variables in one model the sampling variance increases and might have reduced statistical power (Hayes, 2013; Thoemmes, MacKinnon, & Reiser, 2010).

Therefore, we tentatively conclude that all six key well-being processes appear to have contributed to the efficacy of the guided positive psychology self-help intervention to some degree, but in particular through improved positive relations and self-compassion. This is an interesting finding because positive relations is often incorporated in comprehensive well-being interventions (Table 1) while stand-alone positive psychology exercises to increase positive relations are scarce and not often evaluated (Gable, Reis, Impett, & Asher, 2004; O'Connell, O'Shea, & Gallagher, 2015). In contrast, both stand-alone and comprehensive self-compassion interventions have been developed and evaluated (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Galante, Galante, Bekkers, & Gallacher, 2014; Jazaieri et al., 2012; Neff & Germer, 2013) but less frequently integrated in comprehensive well-being interventions (Table 1). Our study suggests that positive relations as well as self-compassion are essential components in comprehensive well-being programs. To summarize, we revealed that "This is your life" seems a cost-effective intervention to ameliorate mental well-being as well as anxiety and depressive symptoms and that an increase of six key well-being processes have mediated these effects, at least in higher educated women.

Who is searching for a flourishing life and who benefited most from the intervention?

The aforementioned results provide support for further implementation of "This is your life". Therefore, it is interesting for mental health practitioners, counselors and coaches to know who participated in this intervention, what motives participants had when they assigned to the program and who might have benefited most from the intervention. Prior studies found that people who were searching online for "more happiness" in the USA (Parks, Della Porta, Pierce, Zilca, & Lyubomirsky, 2012) and Canada (Sergeant & Mongrain, 2015) could be divided in two groups by cluster analysis. These studies revealed a "non-distressed" cluster of people with average depression symptoms and average life-satisfaction scores and a "distressed" cluster of people with more severe depressive symptoms and below average life-satisfaction scores.

Table 1. Overview of some multicomponent well-being enhancing interventions based on a positive psychology framework.

Non-clinical samples				Clinical samples		
This is your life (self-help book and email support)	Psyfit (online self-help)	Better days (online self-help)	Working for wellness program (group sessions)	Resilience intervention China (group sessions)	Positive psychology intervention (group sessions)	Positive psychotherapy (group sessions)
Positive emotions (1)	Positive feelings, positive thinking (2)	Engagement and pleasant activities (2)	-	Positive thinking (2)	(Savoring) positive emotions (1)	- Signature strengths and positive emotions (2)
Discovering and using strengths, flow (2)	Mission and goals, personal values (1)	- Character strengths (3) - Flow (8)	- Knowing and using strengths (1) - Goal striving (2) - Flow (3)	Goal-setting (4)	- Personal strengths (7) - Sense of living, goal setting (8) Gratitude, optimism (4)	- Savoring (10) Character strengths (1)
Optimism, hope (3)	Thinking and feeling, optimism (5)	- Optimism (7) - Gratitude (1) + (5) + (9)	-	-	Gratitude, optimism (4)	- Gratitude (5) - Hope and optimism (7)
Self-compassion (4)	-	-	-	-	Self-compassion (6)	Satisficing vs. maximizing (6)
Resilience (5)	Master your life (6)	- Mastery and reattribution (6) - Adaptation and attribution (10)	-	-	Resilience (9)	Good vs. bad memories (3)
Positive relations (6)	Positive relations (3)	Acts of kindness (4)	Relationship and altruism (4)	Altruism (3)	Positive relationships (5)	- Forgiveness (4) - Positive communication (8) - Signature strengths of others (9)
	Living in the moment (4)	Stress and mindfulness (11)	-	-	Emotion regulation, mindfulness (3)	Positive legacy & Gift of time (11)
		Consolidation of learning (5)	Consolidation of learning (5)	Self-efficacy (1)	-	-
						The full life (12)

Numbers in parentheses represent the order of sessions.

Bolier et al., 2012; Chaves et al., 2016; Drozd, Mork, Nielsen, Raeder, & Bjørkli, 2014; Page & Vella-Brodick, 2012; Schotanus-Dijkstra, Drossaert, Pieterse, Walburg, & Bohlmeijer, 2015; Seligman et al., 2006; Yu, Lam, Liu, & Stewart, 2015

Our study provided further evidence for the existence of these two groups. Namely, our excluded group of participants from the RCT might represent the “distressed” cluster because they were mainly excluded due to moderate or severe clinical symptomatology ($n = 147$). While our included group of participants is probably similar to the “non-distressed” cluster because they may have had only mild clinical symptomatology besides low or moderate levels of mental well-being. More important, our mixed method study, as described in *Chapter 9*, adds to this knowledge because we found within the “non-distressed” group a wide array of help-seeking motives. These motives run from a desire to flourish in life (*“I hope and expect from this course to enjoy my pleasant emotions more, to be more kind to myself and to develop positive relations with persons I connect with”*) to mentioning severe distress, for example by cumulative stressful life events or a negative or depressed mood (*“I want to achieve with this course that I get things done and to learn how I can deal with my depression”*).

Furthermore, our study revealed no clear association between the main motives for participating (i.e. suffering, growth or other motives) and adherence, client satisfaction and change scores in mental well-being, anxiety and depressive symptoms. Next, we divided the participants in our study in four groups: (1) people with only suffering-related motives (17%), (2) people with both suffering and growth motives but these were predominantly related to suffering (32%), (3) people with motives predominantly related to growth (38%), and (4) people with only growth-related motives (13%). None of these groups were related to better (or worse) outcomes between baseline and 3 or 6 months. These findings suggests that “This is your life” attracts a heterogeneous group of people and might be of importance from a public mental health perspective. Namely, positive psychology-based interventions might attract larger and broader target groups compared to the more traditional early interventions based on cognitive behavior therapy (CBT). For example, people may be more willing to accept help when it targets their strengths rather than their weaknesses such as suffering from mental health complaints. Also, positive psychology-based interventions might reach people earlier than CBT-based interventions because our study showed that a large group of people were mainly seeking help for further developing their potential, probably in order to prevent future mental disorders or a worsening of mild complaints.

Strengths and limitations

Each study within this thesis has its strengths and limitations which are described in each individual chapter. Overall, the current thesis has several major strengths. First, the sample sizes were large in both the representative NEMESIS-2 study and the RCT-study. Therefore, our primary analyses yielded adequate power to reject the null hypotheses.

Second, the results of the diverse studies are based on representative data of the Dutch population (Part I) and sufficient data due to high adherence to the self-help intervention and rather low drop-out rates at assessment times of the RCT-study (Part II). Not surprisingly, completers-only analyses (data of people who completed each survey) revealed similar results when compared to intention-to-treat analyses where incomplete data was imputed.

Third, we used well-validated Dutch versions of instruments to assess mental well-being (MHC-SF), psychopathology (CIDI 2.0 for DSM-IV diagnosis, HADS-A for anxiety symptoms and HADS-D for depressive symptoms) and some specific well-being variables (LOT-R for optimism, BRS for resilience, SCS-SF for self-compassion and SPR for positive relations). However, Dutch translations of the mDES for positive emotions (by Maastricht University) and SUS for use of strengths (by University of Twente) have not yet been validated. The English versions have shown good psychometric properties (Fredrickson, Tugade, Waugh, & Larkin, 2003; Govindji & Linley, 2007; Schaefer, Nils, Sanchez, & Philippot, 2010; Wood, Linley, Maltby, Kashdan, & Hurling, 2011) and because our study revealed consistent findings across all measures, the Dutch version of the mDES and SUS are might also be valid although this warrants further study.

Fourth, since e-Mental health has received increased attention in research and practice, one might question the novelty of using an intervention that consists mainly of a self-help book. However, self-help books are popular and can reach large groups of people. Whereas authors of (positive) psychological self-help books are strongly inclined to integrate evidence-based practice (e.g. Brown, 2010; Lyubomirsky, 2007; Walburg, 2010), studies about the efficacy of such comprehensive books have been scarce. Besides, not all people prefer treatment over the internet, might feel skeptical about it, or have concerns regarding confidentiality or quality of care (Moock, 2014).

Several limitations also apply to the current thesis. The RCT-data have emerged from a self-selected sample of people who were intrinsically motivated to work on their well-being and resilience. This sample consisted of mainly higher educated, middle-aged

women, which seems a typical composition of participants for psychological intervention studies recruited in the general population (e.g. Bolier et al., 2013a; Fledderus et al., 2012; Schueller & Parks, 2012). Therefore, the study results are representative for implementation of this self-help intervention in public mental health and clinical practice, but our sample limits the generalizability of the findings to the general population. A public mental health goal might be to increase the prevalence of flourishing mental health in the general population, but requires a representative population sample with more men, lower educated people and more culturally diverse groups than was present in the current study.

Another limitation is that the type of imputation method was not consistent within this thesis. In the representative NEMESIS-2 study, we used Hotdeck imputation because there were few missing data and this method was therefore recommended by one of the reviewers of the study described in *Chapter 2*. In our RCT-study, we used the expectation maximization (EM) algorithm which is a conventional method for imputation in trials and was chosen when we initiated the study as described in *Chapter 4*. One might argue that both imputation methods are not the preferred choice since multiple imputation methods are widely available for the large scientific public and incorporated in statistical packages like SPSS. However, we used repeated measures analysis of variance, the PROCESS tool for moderation and mediation analyses, and an Excel tool for the cost-effectiveness analysis in which the use of multiple imputed datasets are not possible (or not easily in the case of repeated measures analyses) to generate pooled results. Researchers have to consider the advantages (more robust results) and disadvantages (more time-consuming) for each study when choosing one imputation method over the other. I made the choice of using Hotdeck imputation and EM imputation because we had few missing data and completers only analyses revealed similar results. Also, I repeated the main RCT-analyses as described in *Chapter 6* with five multiple imputed datasets in SPSS, and all datasets of the repeated measures analysis of variance revealed almost identical results.

Another discrepancy within this thesis can be found in the primary outcome measures of each study. We used the categorical outcome variable of the MHC-SF (flourishing or not) in the representative NEMESIS-2 data and in the cost-effectiveness analysis, while we used the continuous outcome variable of the MHC-SF (mental well-being on a scale from 0-5) in the remaining studies. We had deliberately chosen the continuous measure as primary outcome variable in the RCT-study which gives a more nuanced picture of the mental well-being continuum and detects genuine changes in

well-being scores compared to a dichotomous outcome. In addition, we were the first to include the categorical measure of flourishing in an intervention study, so we had no information about expected magnitude of effects on this outcome. The continuous variable was, therefore, also chosen as the primary outcome in the power analysis. However, we did report dichotomous outcome measures in most studies based on the RCT-data and used this outcome as primary measure in the CEA-study. A priori, we would have needed a larger sample size to detect a “powerful” effect of the proportion of flourishers versus non-flourishers. As we have seen in *Chapter 6 and 7*, though, we did find significantly more flourishers in the intervention group compared to the control group. Thus, we found this effect in a somewhat underpowered sample, strengthening our finding that it is possible to enhance flourishing by using a multicomponent well-being intervention in a sample recruited in the general population.

A final limitation is the use of a wait-list control group rather than an active control group, care-as-usual or “component control group” where one or more components are removed or added to the intervention (Boot, Simons, Stothart, & Stutts, 2013). Although wait-list control groups are still common in psychological research, it is likely that the results of the RCT-study are overestimated (Bolier et al., 2013b; Boot et al., 2013; Mohr et al., 2009). This might be explained by different expectations of participants in the intervention group versus participants in the no-active (placebo) control group (Boot et al., 2013; Cunningham, Kypri, & McCambridge, 2013). However, the use of a wait-list control group might be appropriate for a first attempt to test the efficacy of novel interventions (Mohr et al., 2009). We also fulfilled the suggestions of Mohr and colleagues (2009) for a valid implementation of a wait-list control group, namely by monitoring the health and well-being of participants by the email counselors, assessment of other help-seeking behavior during the trial and the continuation of assessments for all participants including those who did not adhere to (or started with) the intervention. Nonetheless, we did not measure the expectations and motivation of participants and it seems more likely to find somewhat lower effect sizes when the intervention would be compared to a placebo-control group.

Implications for future research and practice

The major implications I have for future research and practice can be integrated in three lines of research: theoretical (and terminology) development, replication research and implementation in practice.

Theoretical development

Huta and Waterman (2013) conducted an extensive review about the differences between hedonic and eudaimonic well-being conceptualizations and concluded: *“It has taken more than 40 years for the empirical study of hedonic conceptions of happiness to reach the current level of conceptual and methodological sophistication. The empirical study of eudaimonia began barely 20 years ago. It will be interesting to see how theory and research on eudaimonia, and its distinction from hedonia, develops in the decades ahead”* (p. 1451). The scientific study and operationalization of flourishing is an even younger field and integrates subjective well-being (hedonia) of which its conceptualization is derived from empirical research (Diener, 1984), with psychological well-being (Ryff, 1989) and social well-being (Keyes, 1998) (eudaimonia) of which its conceptualizations have been derived from theoretical research. A critique on these specific well-being theories is that they often describe certain dimensions of mental well-being rather than defining mental well-being as a whole (Dodge et al., 2012).

Nevertheless, an important direction for future research seems to be to evaluate—and possibly revise—the psychological and social well-being theories with the current evidence that stems from theoretical and empirical research. For instance, Ryff’s conceptualization of six elements of psychological well-being was introduced in 1989 and has had a major impact in the scientific literature with more than 350 empirical studies (Ryff, 2014). Psychological well-being is also increasingly used as outcome variable in intervention studies not limited to the positive psychology discipline (Weiss et al., 2016). However, other influential theories such as the self-determination theory (Deci & Ryan, 2000), the broaden-and-build theory (Fredrickson, 2001) and the PERMA framework (Seligman, 2011) also contain important elements of mental well-being which could be integrated in a revised definition of psychological well-being or a new conceptualization of flourishing mental health. For example, “competence” or “engagement” is an important ingredient of the self-determination theory and the PERMA framework, but not incorporated in Ryff’s operationalization of psychological well-being (Ryff, 1989) or the positive mental health framework (MHC-SF) of Keyes (Keyes, 2002; Keyes, 2007; Keyes et al., 2008). Also, according to the broaden-and-build

theory, positive emotions are needed to broaden the attention of people. In turn, this broadened attention helps to build (alter, learn or develop) other positive behaviors (Fredrickson, 2001; Fredrickson & Losada, 2005). The MHC-SF does measure positive affect with one hedonic well-being item, but to be classified as a flourisher, this requires high levels of only one of the three hedonic well-being items (i.e. life-satisfaction, positive affect or happiness) and does not include positive affect per se. It might be worthwhile to test whether people need to score high on at least positive affect rather than on one of the three items.

A related research aim for future research might be to identify what exactly constitutes a flourishing life? For example, concepts like optimism, competence and self-compassion are not (directly) included in the items of the MHC-SF (Hone et al., 2014) and the cut-off values for having flourishing mental health have been chosen arbitrarily (Keyes, 2002; Keyes et al., 2008). Systematic literature reviews, daily monitoring of emotions with experience sampling methods, qualitative interview studies among the very happy and well-lived people and sophisticated psychometric analyses of existing and novel instruments to assess mental well-being and flourishing seem essential methods to examine what constitutes a flourishing life. For example, Gokcen and colleagues (Gokcen, Hefferon, & Attree, 2012) used an open-ended survey among 222 students to examine how students perceive and describe a flourishing student and a non-flourishing student. Major qualitatively derived themes were self-actualization and success, but also academic and social engagement and positive affect. According to the authors, these themes correspond to four of the five elements of the PERMA model: positive emotions (positive affect), engagement (academic engagement), relationships (social engagement) and achievement (success).

Finally, positive psychologists might benefit from more consensus about terminology and clear definitions of key-concepts of which Huta and Waterman (2013) have provided a first overview. For scientists not familiar with mental well-being research, the differences in terminology seem rather confusing and have resulted in debates towards the usefulness of separating eudaimonic well-being from hedonic well-being (Kashdan, Biswas-Diener, & King, 2008). *"The multiplicity of approaches in the study of wellbeing has given rise to blurred and overly broad definitions of wellbeing, with researchers using the construct of 'wellbeing' synonymously with 'happiness,' 'quality of life,' or 'life satisfaction.' Furthermore, some researchers have preferred to ignore the multifaceted nature of wellbeing and equate it with one construct (often life satisfaction), leading to the unfortunate omission of other important aspects of wellbeing."* (Forgeard et al., 2011, p. 81)

Replication research

Replication of the studies described in this thesis is warranted, although psychological research is rarely replicated in an identical fashion (Anderson et al., 2016). Researchers and practitioners have their own (innovative) ideas, get inspired by prior treatment approaches but want to improve this further for their intended target population. In general, it seems important to adapt certain interventions to fit within cultural circumstances, language or typical population characteristics such as age, cognitive abilities and severity of symptoms. However, there is an exponential growth of the development of psychological interventions, and each intervention will probably never “cure” or help all people who follow a certain amount of the program. Is one intervention or treatment better than others? Why (not) and what works for whom? Are the same people susceptible for good (or bad) outcomes after intervening no matter what intervention they receive, or will each intervention be successful for a slightly different group of participants? In other words, how can we make sure that those in need receive the right intervention or treatment at the right time and at the right place? Several researchers (Layous & Lyubomirsky, 2012; Proyer, Wellenzohn, Gander, & Ruch, 2015), including myself, believe that the time has come to answer these type of questions rather than developing novel interventions of which much of its efficacy will depend on whether it will be used and implemented in practice.

Regarding the multicomponent well-being intervention investigated in this thesis, “replication” of its efficacy can be realized by performing a meta-analysis of multicomponent positive psychology-based interventions, which we are currently conducting. Researchers might also consider future studies wherein different—but somehow similar—self-help interventions are compared in a large trial or in a series of trials. For example, in a large sample of people with mild and moderate depressive symptoms, different interventions might be offered to determine which intervention might be (most) effective for whom, which intervention(s) are preferred and which intervention(s) are (most) cost-effective? In The Netherlands we might compare the self-help book “This is your life” for people with suboptimal levels of mental well-being and mainly mild depressive symptomatology with the self-help book “Living to the full” (Fledderus et al., 2012) for people with mainly moderate depressive symptoms, and these conditions might also be compared to their web-based counterparts (Pots et al., 2016). In addition, these self-help interventions might be compared to the web-based interventions “Psyfit” (Bolier et al., 2013a) for people with suboptimal levels of mental well-being and mainly mild depressive symptoms and to “Colour your life” (De Graaf et al., 2009; Warmerdam, van Straten, Twisk, Riper, & Cuijpers, 2008) for people with

mainly moderate depressive symptoms which is based on one of the most evaluated courses for depressive symptoms: “Control your depression” (Anderson et al., 2005; Clarke & Lewinsohn, 1989; Cuijpers, 1997; Gregory, Schwer Canning, Lee, & Wise, 2004). To increase adherence to such interventions, it seems vital to provide some form of (therapeutic) support (Cuijpers, Donker, van Straten, Li, & Andersson, 2010; De Graaf et al., 2009; Gerhards et al., 2011). However, the quality of this support provided by therapists, counselors, (unexperienced) psychology students or (automated support by) computers remains unclear (Holländare et al., 2016; Kats, 2016; Matten, 2016; Paxling et al., 2013).

Implementation in practice

The multicomponent well-being intervention “This is your life” seems an attractive intervention for a broad public and we demonstrated its cost-efficacy in a self-selected population recruited in the general population. Similarly, positive psychology-based interventions are also popular and can reach large groups of people compared to the more traditional CBT-based interventions. Both self-help books and positive psychology seems to be appealing for the lay public, and could potentially be of great importance for public mental health and clinical practice. In this regard, two promising studies have shown that a positive psychology-based intervention (using bibliotherapy or group therapy) was equally effective compared to a CBT-based intervention (Chaves et al., 2016; Parks & Szanto, 2013), expanding the possibilities for clients and practitioners.

Currently, there is a one-day training workshop available wherein mental health care professionals and coaches learn to implement “This is your life” in their therapy and coaching. Because of the generic character of the intervention, it seems also worthwhile to implement the intervention in (high)schools and universities, the workplace and in general practice (GP). Pilot projects implementing “This is your life” as guided self-help for people with chronic somatic diseases and for people with mild disorders in primary mental health care (e.g. GPs) are now under way. Since 2014, GPs in The Netherlands have become responsible for the prevention and early treatment of common mental health problems like depression and anxiety. The Trimbos Institute is now implementing (blended) e-Mental health in GPs of which “Psyfit” and “Colour your life” are the two interventions for depressive symptoms. However, not all patients want to participate in online interventions. While some people might prefer face-to-face counseling or therapy, others might prefer the use a self-help book of which “This is your life” and “Living to the full” seem valuable options. Nurse practitioners can add email support or face-to-

face support to these interventions. The company doctor might fulfill this role in the workplace and student psychologists in schools and universities.

Multicomponent well-being interventions seem also feasible in specialized mental health care and in clinical populations as can be seen in Table 1. However, most clinical treatments wherein positive psychology is integrated are examined in people with a depressive disorder. This thesis suggests that it seems also fruitful to test the feasibility and efficacy of the intervention in people with an anxiety disorder. Also, it seems promising to further explore the feasibility and efficacy of “This is your life” or other multicomponent mental well-being interventions in people with a suicide risk (Huffman et al., 2014), bereaved people (Boelen, 2015), people with schizophrenia (Schrack et al., 2016) or people with an eating disorder (Braun, Park, & Gorin, 2016). For example, higher optimism was significantly associated with lower levels of prolonged grief disorder and depression in bereaved people who lost a loved one in the last year. However, this study also found that optimism was a predictive factor of depressive symptoms 6 and 15 months later but was not a significant predictor of later prolonged grief disorder symptoms (Boelen, 2015). Another series of studies—towards self-compassion and eating disorders—have shown that (1) a larger improvement of self-compassion early in treatment was related to a larger decrease of feelings of shame, and that a larger decrease of shame early in treatment was related to a faster decrease of eating disorder symptoms in a transdiagnostic sample (Kelly, Carter, & Borairi, 2014), (2) a compassion-focused self-help intervention for inpatients with a binge eating disorder was more effective in ameliorated eating disorder symptoms, weight concern and self-compassion compared to a CBT-based self-help intervention (Kelly & Carter, 2015) and (3) a compassion-focused therapy group added to care as usual was more effective than solely care as usual on self-compassion, shame and eating disorder symptoms in a transdiagnostic outpatient sample (Kelly, Wisniewski, Martin-Wagar, & Hoffman, 2016). Notably, a multicomponent well-being intervention like “This is your life” should not be a substitute of regular treatment for severe disorders, but might be especially suitable in clinical practice as an add-on treatment intervention (early in treatment) and as a relapse prevention intervention.

Finally, it is of great importance that the government plays a vital role in reducing mental disorders and enhancing mental well-being in the general population. For example, the government has successfully invested in lifestyle behaviors in the combat against obesity and related issues (VWS, 2015). Such an approach is mainly based on informing and stimulating the population about behavioral change (e.g. eating

healthy, exercise regularly, quit smoking), which seems also necessary for the implementation of positive psychology based exercises in daily living. The six major prevention themes of the Ministry of Health, Welfare and Sport (VWS) in The Netherlands are smoking, excessive alcohol use, (severe) overweight, exercise, depression and diabetes. VWS has also acknowledged that health is more than the absence of disease and that health should be more broadly and positively defined (VWS, 2015). This seems an opportunity to increase awareness for strengthening positive behaviors of people to make them more resilient and flourishing in life. Or to add flourishing mental health as a theme to the prevention program of VWS. Such an approach might also be beneficial for the other prevention themes aimed at problem behaviors but, still, little is known about the benefits and detrimental effects of stimulating flourishing mental health in the general population.

A recent attempt to redefine the WHO definition of health seems an important step towards a focus on the positive rather than the negative. Huber and colleagues proposed that the current definition of health (*“a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”*) should be changed into: *“the ability to adapt and to self-manage, in the face of social, physical and emotional challenges”* (Huber et al., 2011; Huber et al., 2016). These researchers also propose to use “positive health” rather than “health”. In the future, VWS might opt for a campaign in The Netherlands about positive (mental) health, such as the “Five ways to well-being” of the Foresight program of the UK government (Aked, Marks, Cordon, & Thompson, 2008). It would be interesting to examine whether such a positive campaign leads to increased awareness of the importance of optimal levels of mental well-being and what people can do to enhance their mental well-being. Furthermore, the Dutch government would do well to monitor more than merely the happiness or life-satisfaction status of their citizens: they could monitor flourishing mental health and use this information for policy, education and promotion of flourishing mental health in everyday life.

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Samenvatting

Summary in Dutch

In dit proefschrift ga ik in op een nieuwe stroming binnen de psychologie: de positieve psychologie. In **hoofdstuk 1** gaf ik een introductie over dit onderwerp. Een veelvoorkomend misverstand is dat deze stroming zich alleen bezig houdt met “positiviteit” en daarbij geen oog heeft voor de problemen en klachten waar mensen tegenaan lopen. Echter, de positieve psychologie hanteert een andere invalshoek en probeert vanuit het bevorderen van mentaal welbevinden een positieve invloed uit te oefenen op het verminderen van psychische klachten en stoornissen. In dit proefschrift ga ik in op een specifiek doel van de positieve psychologie, namelijk het vergroten van “*flourishing*” ofwel floreren. Floreren is daarbij gedefinieerd als het hebben van een hoge mate van hedonisch welbevinden (gelukkig en tevreden zijn met jouw leven) in combinatie met een hoge mate van eudaimonisch welbevinden (een zinvol leven waarin je betekenisvol en vriendelijk bent voor jezelf en voor anderen). Floreren of tot bloei komen lijkt een soort ultiem doel: hoe zorgen we ervoor dat mensen zich gelukkig voelen én dat ze optimaal functioneren als individu en in de maatschappij? Tot op heden is er nog weinig onderzoek gedaan naar floreren, en de studies die er zijn, zijn voornamelijk uitgevoerd in de Verenigde Staten. We weten bijvoorbeeld nog niet of floreren vergroot kan worden, hoe dan en wat het effect zou zijn. Wie is op zoek naar een florerend leven en wie heeft het meeste baat bij een interventieprogramma om floreren te vergroten? Dit zijn enkele vragen die in dit proefschrift beantwoord worden.

Bevolkingsonderzoek: prevalentie, karakteristieken en het belang van floreren in Nederland

In **hoofdstuk 2** beschreven we een studie die gebruik maakte van een groot representatief onderzoek dat uitgevoerd werd door het Trimbos-instituut onder ruim 5.000 mensen in de periode 2007-2009. We onderzochten als eerste hoeveel mensen er in Nederland floreren. Data van dit Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2) toonde aan dat circa 37% van de Nederlanders floreert. Opvallend was dat bijna 80% van de Nederlanders hoog scoorde op hedonisch welbevinden, maar dat slechts (38%) hoog scoorde op eudaimonisch welbevinden. Vervolgens keken we naar wat voor type mensen nu vaker lijkt te floreren. Dit waren bijvoorbeeld vrouwen (ten opzichte van mannen), jongeren (ten opzichte van ouderen), hoger opgeleiden (ten

opzichte van lager opgeleiden), mensen die niet alleen woonden (ten opzichte van mensen die wel alleen woonden) en mensen die betaalde arbeid verrichtten (ten opzichte van onbetaalde of geen arbeid). Deze sociaal-demografische variabelen bleken echter maar een kleine relatie te hebben met floreren. De relatie met persoonlijkheidskenmerken was bijvoorbeeld groter. Mensen die floreerden scoorden hoger op conscientieusheid (gewetensvol, nauwgezet etc.) en extraversie en lager op neuroticisme (emotionele stabiliteit). Sociale steun en positieve levensgebeurtenissen waren tevens gerelateerd aan floreren, ook wanneer er gecontroleerd werd voor sociaal-demografische factoren en persoonlijkheidskenmerken.

Een nadeel van deze studie was dat het een correlationeel onderzoek betrof. Dat houdt in dat we geen conclusies kunnen trekken over oorzaak en gevolg. In een tweede onderzoek hebben we daarom de relatie tussen floreren en psychische stoornissen onderzocht in een longitudinale studie op basis van twee metingen van de NEMESIS-2 studie. In **hoofdstuk 3** beschreef ik dit onderzoek. Het hield in dat we bij een grote groep mensen mentaal welbevinden (de mate van floreren) gemeten hebben tussen 2007 en 2009 en bij dezelfde mensen psychische stoornissen tussen 2010 en 2012. We onderzochten of floreren een voorspeller was van het hebben van een nieuwe of teruggekeerde psychische stoornis drie jaar later. We keken naar angststoornissen, depressiestoornissen en verslavingsstoornissen. Ons onderzoek liet als tweede in de wereld en als eerste in Europa zien dat floreren het risico op het ontstaan van een gediagnosticeerde psychische stoornis verkleint. Mensen die floreerden hadden drie jaar later 53% minder kans op het ontwikkelen van een nieuwe of teruggekeerde angststoornis en 28% minder kans op het ontwikkelen van een depressiestoornis. Floreren was echter niet significant gerelateerd aan het ontstaan van verslavingsstoornissen drie jaar later. Deze bevindingen onderstrepen het belang van het behouden en bevorderen van een florerende algemene bevolking.

Interventieonderzoek: is het mogelijk om mensen te laten floreren door middel van een zelfhulpcursus en wie heeft er het meeste baat bij zo'n cursus?

In het eerste deel van dit proefschrift vonden we bewijs voor het belang van floreren in de algemene bevolking. Maar hoe kunnen we floreren verhogen? In **hoofdstuk 4** beschreven we de onderzoeksopzet van een gerandomiseerde gecontroleerde studie (RCT) naar de effectiviteit van een zelfhulpcursus om het mentaal welbevinden en floreren te verhogen. De cursus bestond uit het boek "Dit is jouw leven" waarin zes kernthema's uit de positieve psychologie worden besproken in acht hoofdstukken. De

kernthema's zijn: positieve emoties, ontdekken en gebruiken van sterke kanten (en flow), optimisme, zelfcompassie, veerkracht en positieve relaties (en spiritualiteit). De RCT staat centraal in de hoofdstukken die behoren bij het tweede deel van dit proefschrift. In **hoofdstuk 5** werd eerst op basis van de nulmeting van de RCT een validatiestudie beschreven van een nieuwe vragenlijst die floreren beoogt te meten. De *Flourishing Scale* (FS) bestaat uit acht items over sociaal en psychologisch welbevinden (eudaimonisch welbevinden) en is in een aantal eerdere studies betrouwbaar en valide gebleken in landen als de Verenigde Staten, Japan en Spanje. De FS was nog niet gevalideerd in Nederland en ook was er nog niet gekeken naar de meetprecisie van de schaal. Met behulp van *confirmatory factor analysis* (CFA) en Rasch analyse werd de validiteit verder onderzocht in een steekproef van mensen met een laag of gemiddeld niveau van welbevinden (zoals gemeten met een andere welbevindenvragenlijst: de *Mental Health Continuum-Short Form*, MHC-SF). Uit de analyses bleek dat de vragenlijst betrouwbaar is voor het meten van eudaimonisch welbevinden. Echter, we vonden ook een scheefverdeling van de scores waarbij we relatief veel hoge scores vonden in onze steekproef van mensen met een laag en gemiddeld niveau van welbevinden zoals met de MHC-SF gemeten was. Ook was de meetprecisie onvoldoende nauwkeurig om de hoogste scores van elkaar te onderscheiden. Tenslotte bleek de externe validiteit beperkt omdat we lagere correlaties vonden met andere constructen (zoals hedonisch welbevinden, angst, depressie en persoonlijkheid) in vergelijking met de MHC-SF. We concludeerden dat de FS betrouwbaar en valide is om eudaimonisch welbevinden te meten, maar dat floreren niet goed gemeten kan worden met de FS vanwege het ontbreken van hedonisch welbevinden items en beperkte meetprecisie bij hogere scores op de FS. Omdat veel mensen bij aanvang van de zelfhulp cursus al hoog scoorden op de FS (maar dus niet op de MHC-SF), was er ook minder ruimte om nog verder te groeien. Mogelijk dat dit ook een reden is geweest waarom we geen effecten vonden van de zelfhulp cursus op de FS (zie hoofdstuk 6), terwijl we die wel vonden op alle andere uitkomstmaten.

In **hoofdstuk 6** lieten we zien dat de zelfhulp cursus "Dit is jouw leven" in combinatie met e-mailbegeleiding effectief is: mensen in de interventiegroep gingen meer vooruit op mentaal welbevinden en floreren in vergelijking met een wachtlijst controlegroep. Het aantal mensen dat floreerde ging bijvoorbeeld van 7% op de nulmeting (bij de screening was dit 0%) naar 30% op de 3 maanden meting en naar 34% op de 6 maanden meting. In de wachtlijstgroep bleef het percentage rond de 8-12% op alle metingen na de screening. Tevens bleken symptomen van angst en depressie significant meer te zijn afgenomen in de interventiegroep dan in de wachtlijstgroep na

afloop van de interventie. Al deze effecten bleven tot en met 6 maanden behouden. Alhoewel we op de 12 maanden meting niet meer kunnen vergelijken met de controlegroep omdat zij na de 6 maanden meting ook het boek ontvingen (zonder e-mailbegeleiding), bleven de gunstige effecten binnen de interventiegroep behouden tot en met 12 maanden. We concluderen dat het mogelijk is om het mentaal welbevinden zo te verhogen dat meer mensen gaan floreren met behulp van een positief psychologische zelfhulpinterventie. Ook benadrukt deze studie dat het mogelijk is om het beperkte aantal symptomen van angst en depressie bij aanvang van de cursus nog verder te reduceren. De cursus lijkt dus bij uitstek geschikt om in te zetten als preventieve interventie in de publieke geestelijke gezondheidszorg. Deze bevindingen werden verder ondersteund door een kosteneffectiviteitsanalyse, zoals beschreven in **hoofdstuk 7**. Uit deze analyse bleek dat er een aanzienlijke gezondheidswinst behaald werd met de zelfhulpcursus in combinatie met e-mailbegeleiding, tegen beperkte extra kosten. Qua kosteneffectiviteit leek “Dit is jouw leven” het daarom beter te doen dan een *online* positief psychologische interventie zonder begeleiding. Echter, de studies zijn niet direct met elkaar vergeleken en in onze studie werd bijvoorbeeld alleen naar zorgkosten en interventiekosten gekeken terwijl in de eerdere studie ook kosten voor productiviteitsverlies werden meegenomen. Het lijkt het waard om te investeren in een positief psychologische interventie als preventiemiddel tegen angst en depressie, maar meer onderzoek is nodig omdat er tot dusverre slechts twee kosteneffectiviteitsstudies zijn uitgevoerd naar een positief psychologische interventie.

In aanvulling op hoofdstuk 6 lieten we in **hoofdstuk 8** zien dat de interventiegroep ook significant meer vooruitgang op de zes welbevindenprocessen positieve emoties, gebruik van sterke kanten, optimisme, zelfcompassie, veerkracht en positieve relaties na afloop van de interventie in vergelijking met de wachtlijst controlegroep. We onderzochten in dit hoofdstuk tevens of deze toename in welbevindenprocessen op de korte termijn (3 maanden) van invloed zijn geweest op het langere termijn effect van nulmeting naar 6 maanden op het vergroten van mentaal welbevinden en het verminderen van symptomen van angst en depressie. We vonden inderdaad dat de zes processen een rol speelden wanneer elk proces onafhankelijk van de andere processen werd bekeken. Wanneer we alle zes processen tegelijk in één mediatiemodel onderzochten, dan vonden we dat vooral positieve relaties en zelfcompassie van invloed zijn geweest op het verhogen van welbevinden en op het verminderen van symptomen van angst en depressie op de langere termijn. Het is echter nog niet duidelijk wat er door de interventie als eerste verbeterd werd, de welbevindenprocessen, de uitkomstmaten (welbevinden, angst, depressie), beide

tegelijk of een andere variabele? Voor vervolgonderzoek is het daarom belangrijk om in de eerste weken van de cursus al enkele metingen te doen. Wel laat onze studie zien dat de zes welbevindenprocessen het effect van de cursus hebben gemedieerd en mogelijk werkzame elementen zijn van de opgetreden gunstige veranderingen door deelname aan de interventie.

Gemiddeld genomen is de interventie dus effectief en kosteneffectief gebleken. En verschillende processen hebben bijgedragen aan de gunstige effecten, waaronder de positieve veranderingen in zelfcompassie en positieve relaties. Maar uit welke mensen bestond de interventiegroep en waarom deden zij mee? Wat hoopten ze te bereiken en hebben bepaalde type mensen meer baat gehad bij de cursus? In hoofdstuk 6 beschrijven we een moderatie-analyse waaruit blijkt dat mannen en vrouwen, jongere mensen en oudere mensen, mensen met een lage of gemiddelde opleiding en mensen met een hoge opleiding allen evenveel baat gehad lijken te hebben bij de cursus. Ook wat betreft persoonlijkheidskenmerken konden we geen subgroepen identificeren die meer of minder baat hebben gehad bij de zelfhulpcursus. In **hoofdstuk 9** hebben we e-mails waarin de deelnemers van de interventiegroep zichzelf voorstelden aan hun begeleider onderzocht met behulp van kwalitatief onderzoek. De meeste mensen noemden één of meer (indirecte) motieven voor deelname gerelateerd aan lijden (psychische klachten, stressvolle gebeurtenissen of omstandigheden), maar ook motieven om te groeien als persoon en beschermende factoren werden genoemd, naast nog andere motieven zoals nieuwsgierigheid en positieve ervaringen met eerdere cursussen of behandelingen. Ongeveer de helft van de deelnemers noemden voornamelijk of alleen maar lijden-gerelateerde motieven (49%) en de andere helft noemde voornamelijk of alleen maar groei-gerelateerde motieven (51%). Opvallend was dat vrijwel geen van de motieven significant gerelateerd was aan tevredenheid met de cursus, het aantal afgeronde modules of verstuurde e-mails of aan een verbetering van het mentaal welbevinden of het verminderen van symptomen van angst of depressie. Deze bevindingen duiden erop dat de zelfhulpcursus voor een breed publiek geschikt en effectief is. Ook heeft een positief psychologische interventie de potentie om een bredere groep mensen aan te trekken die anders wellicht niet de (preventieve) zorg krijgen die zij nodig hebben.

We sloten dit proefschrift af met een algemene discussie (**hoofdstuk 10**) waarin we de belangrijkste bevindingen hebben samengevat, sterke punten en beperkingen van het gehele proefschrift bespraken en aanbevelingen deden voor toekomstig onderzoek en voor de praktijk. De belangrijkste sterke punten van dit proefschrift zijn de grote steekproeven van zowel de longitudinale als RCT data, de representativiteit van de steekproeven ten aanzien van de algemene Nederlandse bevolking (NEMESIS-2 studie) en preventieve interventies voor mensen uit de algemene bevolking (RCT) en het gebruik van veelal betrouwbare en valide vragenlijsten. Beperkingen van dit proefschrift waren de ondervertegenwoordiging van mannen en lager opgeleiden in de RCT-studie, inconsistentie in het gebruik van methoden om data te imputeren en in het gebruik van primaire uitkomstmaten in elke studie, en het gebruik van een wachtlijst controlegroep in de RCT in plaats van een actieve (placebo) controlegroep. Richtingen voor toekomstig onderzoek zijn onder andere het ontwikkelen van een breed gedragen definitie van mentaal welbevinden en van floreren en consistentie in gebruik van terminologie van dergelijke begrippen. Ook zou het interessant zijn om “Dit is jouw leven” met andere interventies voor ongeveer dezelfde doelgroepen te vergelijken (wat is kosteneffectiever, voor wie?) en waar en op welke manier kan “Dit is jouw leven” het beste geïmplementeerd worden in de praktijk. Daarnaast zou de overheid een belangrijke rol kunnen spelen in het vergroten van mentaal welbevinden en floreren (en in het verminderen van psychische stoornissen) in de algemene Nederlandse bevolking. Depressiepreventie is een van de speerpunten van het ministerie van Volksgezondheid, Welzijn en Sport en daarin ligt ook een kans om mensen vooral hun sterke kanten en hun potentieel te laten ontdekken en gebruiken om veerkrachtiger in het leven te staan en bijvoorbeeld een toekomstige depressie of terugkerende depressie te voorkomen. Door “gezondheid” te vervangen in “positieve gezondheid” en een landelijke campagne over positieve (mentale) gezondheid te starten zoals in landen als Groot-Brittannië is gedaan, zou ook in Nederland de aandacht voor het “positieve” versterkt kunnen worden. De overheid zou daarnaast ook floreren kunnen gaan meten in de algemene bevolking in plaats van alleen levenstevredenheid of geluk. Deze informatie kan dan gebruikt worden voor beleid, onderwijs en het bevorderen van floreren in het alledaagse leven.

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About the author

Marijke Schotanus-Dijkstra (1984) was born and raised with two brothers in Gieterveen, Drenthe, The Netherlands. She went to high-school in Stadskanaal and finished a Bachelor degree in Sports, Health and Management at the Hanzehogeschool in Groningen in 2005. She finished her Master's degree in Clinical and Health Psychology at the Utrecht University in 2009. From 2009 to 2013, she worked as a researcher at the Trimbos Institute in Utrecht. She participated in various projects such as the prevention of substance use in people with intellectual disabilities, after care in people with hepatitis C, peer support for people who are bereaved by suicide, prevention of depression by physical exercise and the nature and extent of mental health prevention activities in mental health care and addiction care. In 2013, Schotanus-Dijkstra started her PhD project at the Trimbos Institute in collaboration with the Center for eHealth and Wellbeing Research at the University of Twente. She provided email counseling to participants of the RCT-study described in this dissertation and supervised five students who provided the rest of the email support during their internship. She also supervised several Bachelor and Master students during their thesis projects and gave some guest lectures.

Schotanus-Dijkstra was a (co-)applicant of several allocated grants and is an ad-hoc peer reviewer for journals like the Journal of Medical Internet Research. She also reviewed abstracts for the Dutch "GGz Kennisdag" conference and the International Positive Psychology Association (IPPA) conference. She was a keynote speaker at the Dutch Positive Psychology Conference and an (invited) speaker at several national and international conferences. She is a member of the Utrecht Research Group for Eating disorders (URGE) and contributed to books like the World Book of Happiness 2.0. Schotanus-Dijkstra currently works as an assistant professor at the University of Twente and follows an accredited education program to become a certified coach.

Marijke Schotanus-Dijkstra is married with Fredo Schotanus and they have two children, Florian (2013) and Noah (2014). She loves to run, fitness, bake and travel.

Marijke Schotanus-Dijkstra (1984) started her PhD study in 2013 at the Trimbos Institute, the Netherlands Institute of Mental Health and Addiction in Utrecht in collaboration with the Center for eHealth and Wellbeing Research at the University of Twente in Enschede. Schotanus-Dijkstra received a Master of Science degree in Clinical and Health Psychology at the Utrecht University in 2009. She worked as a researcher at the Trimbos Institute within the department of public mental health for several years before starting this PhD project about "Flourishing mental health". See for more information: www.howtoflourish.nl (Dutch) or www.howtoflourish.nl/research (English) (launched on December 14th).

In psychology research and clinical practice the focus has long been predominantly on how to repair subclinical complaints and mental disorders. Since the introduction of positive psychology in 2000, many researchers and psychologists today not only help people to repair the negative and focus on their weaknesses but also help people to build their full potential and focus on their strengths and the positive things in life. Flourishing mental health is a state wherein people use their full potential in connection with others and society. In this PhD thesis, Marijke Schotanus-Dijkstra examined the prevalence, characteristics and importance of flourishing mental health using longitudinal data. She also evaluated the efficacy and cost-effectiveness of a multicomponent well-being intervention called "This is your life". The aim of this intervention is to increase mental well-being and flourishing mental health and, thereby, to prevent anxiety and depressive disorders in people with suboptimal levels of mental well-being.

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