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Examining well-being in posttraumatic stress disorder treatment: An explorative study

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Abstract

Although the importance of well-being in mental health is widely acknowledged, well-being as a predictor of and outcome in the treatment for posttraumatic stress disorder (PTSD) has received little attention. This naturalistic study aimed to investigate well-being in the context of care-as-usual treatment for PTSD. Patients with PTSD attending a community mental health center ($N = 318$) completed measures of well-being and PTSD symptoms before and after symptom-focused treatment. Following treatment, well-being increased among patients with PTSD, with emotional, $d = −0.25$, and psychological well-being, $d = -0.24$, showing the largest improvements relative to social well-being, $d = −0.15$. Although levels of well-being improved overall within the sample, participant scores on measures of well-being remained low compared with the general population. Well-being predicted treatment efficiency such that participants with more severe PTSD symptoms benefitted more from care-as-usual treatment when they reported relatively high levels of well-being at the start of treatment. The findings suggest a benefit to including well-being as a pretreatment and outcome variable when evaluating PTSD treatments.

Examining well-being in posttraumatic stress disorder treatment: An explorative study

Posttraumatic stress disorder (PTSD) is a complex and debilitating disorder that results from experiencing or witnessing a traumatic event (American Psychiatric Association, 2000). The lifetime prevalence of PTSD is around 8% in the general population (Kessler et al., 2005), and the disorder is associated with a higher risk of suicide and intentional self-harm (Jakupcak et al., 2009), decreased quality of life (Gill et al., 2014), and elevated rates of substance use disorders (Carlson et al., 2010). Most

patients with PTSD respond well to exposure therapies, such as prolonged exposure (PE; Foa et al., 2019) and eye movement desensitization and reprocessing (EMDR; Shapiro, 1989), but treatment dropout rates are high (Imel et al., 2013), and many patients continue to have substantial residual symptoms following treatment (Larsen et al., 2019; Resick et al., 2012). For instance, in a sample of female sexual assault survivors, Resick and colleagues (2012) found that 20% of participants still met the criteria for PTSD during the 5- and 10-year follow-up periods after exposure therapy. This was likely due to participants being unresponsive to the original treatment (Resick et al., 2012). It has been estimated that as many as one third of individuals with PTSD continued to report clinical

levels of PTSD symptoms after treatment (Larsen et al., 2019).

When assessing treatment response, researchers have suggested that there is a benefit to considering not only symptom severity but also well-being (Bohlmeijer & Westerhof, 2020; Fava et al., 1998). Well-being can be considered in the context of three domains: emotional, psychological, and social well-being. Emotional well-being follows the hedonic tradition of happiness and includes happiness, life satisfaction, and positive affect (Diener, 1984). Psychological and social well-being follow the eudaimonic tradition of happiness. Psychological well-being reflects optimal individual functioning and comprises self-acceptance, personal growth, purpose in life, positive relations, autonomy, and environmental mastery (Ryff, 1989). Social well-being reflects optimal functioning within society and the community, which involves social integration, social contribution, social coherence, social actualization, and social acceptance (Keyes, 1998).

In the past, well-being was not recognized as an important factor in treatment response because it was considered to be relatively stable, as reflected in the metaphor of the hedonic treadmill. Scholars assumed that an individual's level of well-being returned fairly quickly to a relatively stable level after they experienced a positive or negative life event (Brickman & Campbell, 1971). Current research, however, conceives well-being as both trait-like and state-like. There is a genetic factor to well-being (Bartels, 2015), and the literature has shown consistently that well-being can be increased (e.g., Sin & Lyubomirsky, 2009; Weiss et al., 2016). Research has estimated that about half of the variance in well-being ratings is trait variance, whereas the other half is state variance (Schimmack et al., 2010).

The present recognition of the importance of well-being for mental health is reflected in the perception of mental health as more than the absence of mental illness but rather also inclusive of well-being (Keyes, 2005; Westerhof & Keyes, 2010). Studies have demonstrated a persistent absence of positive qualities, such as well-being, in various psychiatric illnesses, including eating disorders (de Vos et al., 2018), mood disorders, anxiety disorders, personality disorders, and developmental disorders (Franken et al., 2018). Such impairments in well-being may hinder full recovery from a psychiatric illness (Fava et al., 1998) and increase vulnerability to future adversity (Keyes et al., 2010; Lamers et al., 2015; Wood & Joseph, 2010). A focus on positive functioning represents a clear paradigm shift, which has profound clinical implications. For instance, correlates that reduce an individual's level of functional impairment might be different from those that promote optimal human functioning (de Vos et al., 2018; Fava & Tomba, 2009).

Targeting well-being in the treatment of patients with PTSD might have several beneficial effects. The "broaden-and-build theory" of positive emotions posits that positive emotions in the aftermath of a traumatic event might build resilience because they broaden one's momentary thought–action repertoire (Fredrickson, 2001). Emotional well-being may also counteract negative experiences by reinforcing the positive cognitive interpretation and decreasing the negativity bias imposed when reacting to tangibly dangerous conditions (Cacioppo et al., 1999; Shmotkin, 2005). Psychological and social well-being have also been considered important in posttraumatic recovery. PTSD patients with higher levels of well-being may have maintained more personal and social resources, which can, in turn, increase their success in recovery (Ryff, 2014). Moreover, one's sense of meaning in life can make traumatic events more interpretable, as it may enable individuals to perceive their lives in comprehensible terms (Shrira et al., 2011). Having a purpose in life, feelings of self-acceptance, experiencing personal growth, having positive relationships, and the perceived capability to manage one's personal functioning and the environmental demands in the aftermath of traumatic events—that is, autonomy and environmental mastery—have all been related to PTSD recovery (Blackburn & Owens, 2015; Brooks et al., 2019). The findings from one recent study demonstrated impaired social well-being of U.S. military veterans, emphasizing the importance of psychosocial functioning among veterans with PTSD (Blakey et al., 2021).

Little research has examined the associations between dimensions of well-being and PTSD symptom clusters. Among individuals with war-related PTSD, the findings of a longitudinal study showed a bidirectional association between quality of life and hyperarousal symptoms (Giacco et al., 2013). The researchers suggested that a positive outlook of life and hyperarousal symptoms may reflect different but related aspects of feeling unsafe. Having a sense of control over the environment, a sense of directedness and intention, and the ability to regulate one's own behaviors (Ryff, 2014) may decrease avoidance among patients with PTSD. However, in a study conducted during the COVID-19 pandemic among a sample of individuals with anxiety disorders, psychological well-being was not related to any of the PTSD symptom clusters (Golińska et al., 2021); however, social well-being was associated with hyperarousal and intrusions. Social well-being may reflect aspects of the assumptive world, including the fundamental belief that the world is benevolent, which has been associated with intrusive cognitions (Freedle & Kashubeck-West, 2021).

Despite these findings, treatments for PTSD typically focus on the reduction of PTSD and related psychological symptoms. Gains in positive functioning are not

commonly considered, except for a few case studies (e.g., Belaise et al., 2005). One study examined the long-term effects of well-being therapy as a rehabilitation intervention in adults who had successfully completed psychological treatment for PTSD (Radstaak et al., 2020). Participants who did not meet the PTSD diagnostic criteria after completing treatment were randomized into treatment-as-usual (TAU) or well-being therapy (WBT) conditions. WBT is a structured psychological treatment that aims to promote well-being and was specifically developed to promote full recovery (Fava et al., 1998). In their study, Radstaak et al. (2020) found that WBT was not any more effective than TAU in increasing levels of well-being; only participants with low levels of well-being at the start of the treatment benefitted more from WBT than TAU.

Considering the importance of well-being for mental health it is highly relevant in the research regarding well-being among patients with PTSD. Therefore, this naturalistic study aimed to explore the effects of care-as-usual PTSD treatment aimed at resolving PTSD symptoms on levels of well-being among patients diagnosed with PTSD. The first study aim was to examine whether well-being in patients with PTSD changed after care-as-usual PTSD treatment and if any observed gains matched optimal levels found among healthy controls. The second aim was to explore the association between changes in posttraumatic stress symptoms and well-being during care-as-usual PTSD treatment aimed at resolving PTSD symptoms.

METHOD

Participants and procedure

The present study was approved by an independent medical ethics committee for research in the Netherlands (METiGG; NL 46248.044.13). Participants were patients with PTSD who followed treatment at a Dutch Psychotrauma Center for outpatient care between March 2013 and October 2015. A total of 883 patients met the inclusion criteria, meaning the (a) met the PTSD diagnostic criteria per the fourth edition, text revision of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV-TR*; American Psychiatric Association, 2000); (b) provided written informed consent; and (c) completed one of four different types of PTSD treatment aimed at resolving PTSD symptoms: EMDR, PE, narrative exposure therapy (NET; Schauer et al., 2011), and stabilization. Participants completed questionnaires to assess PTSD symptoms and well-being before treatment (Time 0; T0) and following treatment (Time 1; T1). Data were taken from a database obtained by routine outcome monitoring (ROM). The data collection period ended in February 2016.

TABLE 1 Participant characteristics

Variable	M	SD	n	%
Age (years)	41.02	11.34		
Female gender			195	61.3
Duration of treatment[a]	10.02	5.52		
Type of treatment[a]				
EMDR			74	52.9
Exposure therapy			34	24.3
NET			24	17.1
Stabilization			8	5.7
Clinical level PTSD symptoms				
T0				92.1
T1				67.4
Well-being categories				
Flourishing				
T0				8.8
T1[b]				18.6
Moderate mentally healthy				
T0				49.1
T1[b]				42.7
Languishing				
T0				42.1
T1[b]				38.7

Note: PTSD = posttraumatic stress disorder; EMDR = eye movement desensitization and reprocessing; NET = narrative exposure therapy; T0 = Time 0; T1 = Time 1.
[a]$N = 140$. [b] $n = 310$ for PTSD symptoms, $n = 194$ for levels of well-being.

Patients with PTSD were considered dropouts when they did not complete the entire test battery at T0 and at least one questionnaire at T1. A total of 662 participants filled out all questionnaires at T0. Of these 662 individuals, 318 completed at least one questionnaire at T1. Treatment dropout and failure to fill out the study questionnaires at T1 contributed to attrition at T1. As such, the study included a total of 318 (36.0%) participants, with 565 (64.0%) having dropped out. Dropout analyses showed no differences in gender, $\chi^2(2, N = 883) = 1.15$, $p = .735$; pretreatment PTSD symptom levels (dropout: $M = 3.02$, $SD = 1.24$ vs. participants: $M = 3.16$, $SD = 1.07$), $F(1, 853) = 2.58$, $p = .109$, $d = 0.12$; or well-being (dropout: $M = 1.83$, $SD = 1.10$ vs. participants: $M = 1.82$, $SD = 1.09$) $F(1, 648) = 0.43$, $p = .836$, $d = 0.02$, between participants and dropouts. However, there was a significant difference in age, $F(1, 854) = 11.32$, $p = .001$, $d = 0.24$ such that participants who had dropped out were younger ($M = 38.21$ years, $SD = 12.06$) than participants who did not dropout ($M = 41.02$ years, $SD = 11.34$). Table 1 displays participant characteristics. More women than men participated in this study, and the average age was 41 years. The average treatment duration was 10 months, and most participants completed EMDR.

Measures

PTSD symptoms

Symptoms of PTSD were measured using the PTSD Symptom Scale (PSS; Foa et al., 1993). This 17-item scale is used to assess the presence and severity of *DSM-IV-TR* PTSD symptoms related to an identified (i.e., index) traumatic event. The PSS has three subscales: Severity of Intrusions (five items; e.g., "Having bad dreams or nightmares about the traumatic event"), Avoidance (seven items; e.g., "Trying to avoid activities or people that remind you of the traumatic event"), and Hyperarousal (five items; e.g., "Being overly alert"). Participants rated items on a 4-point Likert scale ranging from 0 (*never*) to 3 (*equal to or higher than five times a week*). The total sum score and the total mean score were then calculated to create an overall PTSD symptom score, with sum scores higher than 15 indicating a clinical level of PTSD symptoms (Wohlfarth et al., 2003). In the present sample, internal reliability for the total scale and subscales at T0 and T1 was adequate to good, Cronbach's αs = .71–.92.

Well-being

Well-being was assessed using the Mental Health Continuum–Short Form (MHC-SF; Keyes et al., 2008; Lamers et al., 2011). The MHC-SF consists of 14 items that measure three components of well-being: emotional well-being (three items; e.g., "During the past month, how often did you feel happy?"), psychological well-being (six items; e.g., "During the past month, how often did you feel that you liked most parts of your personality?"), and social well-being (six items; e.g., "During the past month, how often did you feel that you had something important to contribute to society?"). Participants were asked to rate the extent to which they had experienced feelings of positive well-being in the previous month, scoring answers on a 6-point Likert scale ranging from 0 (*never*) to 5 (*every day*). A mean score was calculated to indicate levels of well-being. In the present sample, the total scale and subscales demonstrated good reliability at T0 and T1, Cronbach's αs = .84–.94.

We also assigned participants to one of three categories of well-being based on a continuous scoring method used to generate three categorizations of well-being: flourishing, moderately mentally healthy, and languishing (Keyes, 2006). Participants were categorized as flourishing when they endorsed at least three of the emotional well-being items and at least six of the 12 psychological and social well-being items with a rating of *almost every day* or *every day* (Keyes, 2005). Participants were categorized as languishing if they endorsed one or more emotional well-being items and six of 12 psychological and social well-being items with a rating of *never* or *once or twice*. Participants who were neither flourishing nor languishing were labeled as moderately mentally healthy.

Data analysis

Analyses were conducted using the Statistical Package for the Social Sciences (SPSS; Version 27). Clinical levels of PTSD symptoms (i.e., PSS scores higher than 15) and well-being categories were calculated. We used Little's Missing Completely at Random (MCAR; Little, 1988) test to analyze whether data at T1 were MCAR. The outcome suggested that missing cases were completely random, $\chi^2(56, N = 318) = 14.08, p = 1.00$. All missing data were imputed using multiple imputation (MI). The Markov chain Monte Carlo (MCMC) imputation procedure was used to conduct MI, and a total of 20 imputed datasets were utilized (Graham et al., 2007). Auxiliary variables used for MI included levels of well-being and PTSD symptoms at T0. Next, descriptive analyses of the whole sample were calculated, including mean values and standard deviations, and the associations between PTSD symptoms and well-being before (T0) and after treatment (T1), using Pearson's r.

To examine the first study aim, the percentages of patients with PTSD who were categorized as flourishing, moderate mentally healthy, or languishing at both pre- and posttreatment were compared to the Dutch norm. This norm was derived from a study in which 5,303 Dutch participants aged 18–64 years completed the MHC-SF (Schotanus-Dijkstra et al., 2016). Moreover, eight paired-sample *t* tests were conducted to assess changes in PTSD symptoms and levels of well-being at T0 and T1. Effect sizes were calculated as Cohen's *d*, with values of 0.2 representing small effects, 0.5 medium effects, and 0.8 large effects (Cohen, 1992).

Regression analyses were used to assess the association between changes in posttraumatic stress symptoms and well-being during treatment. First, predictor variables and outcome variables were standardized. Second, the assumptions for normality, homoscedasticity, and multicollinearity were checked. All assumptions were met such that the residuals of the regression followed a normal distribution and were equally distributed, no outliers were detected (i.e., Cook's distance less than 1.0), and all variance inflation factors were less than 5 (Hair et al., 2010).

Two regression analyses were utilized to examine the associations between changes in PTSD symptoms and well-being. They included dependent variables of T1 PTSD symptoms or T1 well-being as well as independent variables of T0 PTSD symptoms, T0 well-being,

and the interaction between PTSD symptoms and T0 well-being.

Stepwise regressions were used to explore the associations between PTSD symptom clusters and well-being dimensions during treatment. Six regression analyses were performed with dependent variables, including T1 intrusion severity, avoidance, hyperarousal, emotional well-being, psychological well-being, or social well-being. The independent variables were PTSD symptom clusters and T0 dimensions of well-being dimensions as the interaction terms between both (i.e., 3×3). This resulted in a total of 15 predictors.

RESULTS

Changes in PTSD symptoms and well-being during treatment

Table 1 shows the clinical levels of PTSD symptoms and the percentages of flourishers, moderate mentally healthy participants, and languishers at T0 and T1. Most participants reported clinical levels of PTSD symptoms at T0 (92.1%); by T1, 67.4% of participants still reported clinical symptom levels. PTSD treatment decreased the percentage of languishers (-3.4%) as well as the percentage of patients with PTSD who were moderately mentally healthy (-6.4%). PTSD treatment increased the number of flourishers from 8.8% to 18.6%. Patients with PTSD were almost 20 times more likely to be languishers, irrespective of treatment; approximately four times less likely to be flourishers before treatment; and, following treatment, about two times likely to be categorized as flourishing as compared to a Dutch sample (Schotanus-Dijkstra et al., 2016). In the Dutch sample, 36.5% of the participants were flourishers, 69.9% of participants were categorized as moderately mentally healthy, whereas 1.6% were categorized as languishing (Schotanus-Dijkstra et al., 2016).

Table 2 shows the descriptive characteristics of and correlations between PTSD symptoms and well-being. These constructs were significantly and negatively correlated at T0, $r(317) = -.44$, $p < .001$, and at T1, $r(317) = -.44$, $p < .001$. Among patients with PTSD, levels of well-being at T0 ($M = 1.82$) and T1 ($M = 2.07$) were more than 1 standard deviation below the Dutch norm ($M = 2.98$, $SD = 0.85$; Lamers et al., 2011).

The t-test results demonstrated that treatment significantly reduced overall PTSD symptoms, $t(317) = 9.12$, $p < .001$, $d = 0.51$, as well as the severity of intrusions, $t(317) = 7.85$, $p < .001$, $d = 0.44$); and symptoms of avoidance, $t(317) = 8.22$, $p < .001$, $d = 0.46$; and hyperarousal, $t(317) = 8.21$, $p < .001$, $d = 0.46$. PTSD treatment also promoted overall levels of well-being, $t(317) = -4.27$, $p < .001$, $d =$

TABLE 2 Posttraumatic stress disorder (PTSD) symptoms, levels of well-being, and their correlations

Variable	PS	SoI	Avoid	HA	WB	EWB	PWB	SWB	T0 M	T0 SD	T1 M	T1 SD
PS	—	.85	.89	.86	−.44	−.45	−.37	−.37	1.67	0.57	1.31	0.76
SOI	.93	—	.60	.62	−.27	−.32	−.21	−.22	1.79	1.41	1.41	0.92
Avoid	.94	.81	—	.65	−.43	−.44	−.38	−.35	1.56	1.20	1.20	0.78
HA	.90	.76	.77	—	−.43	−.40	−.36	−.39	1.71	1.37	1.37	0.78
Well-being[a]	−.48	−.42	−.47	−.43	—	.82	.94	.89	1.82	1.09	2.07	0.99
EWB	−.49	−.44	−.50	−.40	.87	—	.69	.69	2.00	2.35	2.35	1.14
PWB	−.44	−.39	−.44	−.39	.96	.80	—	.76	1.98	2.27	2.27	1.11
SWB	−.40	−.32	−.39	−.40	.89	.65	.76	—	1.51	1.68	1.68	1.01

Note: $N = 318$. Values above the diagonal represent Time 0 (T0; i.e., pretreatment) correlations; values in italic below the diagonal represent Time 1 (T1; i.e., posttreatment) correlations. The eight study variables at T0 and T1 were the within-subjects variables, and treatment type (i.e., eye movement desensitization and reprocessing vs. exposure therapy vs. narrative exposure therapy vs. stabilization) was the between-subjects variable. Neither the between-subjects effects, $F(3, 136) = 0.17–2.43$, $ps = .068–.511$, nor the interaction effects, $F(3, 136) = 0.12–2.16$, $ps = .095–.950$, were significant. PS = PTSD symptoms; SoI = severity of intrusions; Avoid = avoidance; HA = hyperarousal; EWB = emotional well-being; PWB = psychological well-being; SWB = social well-being.
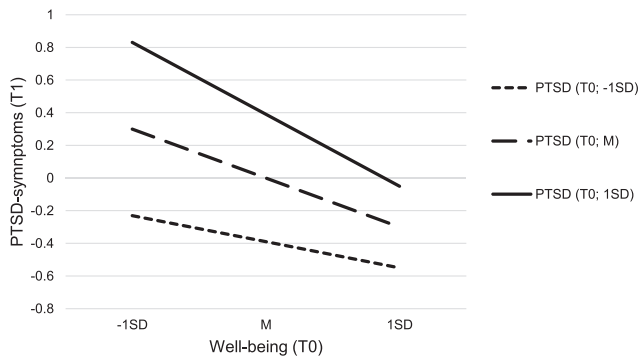aThe Dutch norm for levels of well-being was $M = 2.98$, $SD = 0.85$ (Lamers et al., 2011).

FIGURE 1 The interaction between pretreatment low, intermediate, and high, levels of well-being at Time 0 (T0) and T0 posttraumatic stress disorder (PTSD) symptoms as a predictor of PTSD symptoms at Time 1 (T1). Note. Low represents values 1 standard deviation below the mean, intermediate represents the mean, and high represents values 1 standard deviation above the mean

−0.24, and levels of emotional, $t(317) = −4.41$, $p < .001$, $d = −0.25$; psychological, $t(317) = −4.23$, $p < .001$, $d = −0.24$; and social well-being, $t(317) = −2.64$, $p = .009$, $d = −0.15$. The effect size for overall PTSD symptoms was medium, the effect size for social well-being was negligible, and all other effect sizes were small.

Predictors of treatment response

Table 3 shows the associations between changes in PTSD symptoms and levels of well-being during treatment. Significant regression equations were found for the dependent variables: T1 PTSD symptoms: $F(3, 314) = 48.90$, $p < .001$, $R^2 = .56$; T1 well-being: $F(3, 314) = 30.49$, $p < .001$, $R^2 = .48$.

Pretreatment (i.e., T0) PTSD symptoms, $\beta = .38$, $p < .001$, and well-being, $\beta = −.30$, $p < .001$, significantly predicted PTSD symptom levels at T1. The interaction between PTSD symptoms and levels of well-being was also significant, $\beta = −.14$, $p < .001$. Figure 1 displays these results and illustrates that treatment was more effective when well-being levels were high at the beginning of the treatment. This effect was particularly strong for patients with relatively high levels of PTSD symptoms at T0 (i.e., 1 standard deviation above the mean) compared with those participants with relatively low levels (i.e., 1 standard deviation below the mean) of PTSD symptoms at T0.

PTSD symptoms at T0 did not predict T1 well-being, $\beta = −.01$, $p = .909$. However, levels of well-being at T0 predicted levels of well-being at T1, $\beta = .47$, $p < .001$. The interaction between PTSD symptoms and well-being at T0 did

TABLE 3 Outcomes of two regression analyses with pretreatment posttraumatic stress disorder (PTSD) symptoms and well-being as the independent variables and posttreatment PTSD and well-being as the dependent variables

Variable	T1 PTSD symptoms				T1 well-being			
T0	β	SE	$t(317)$	p	β	SE	$t(317)$	p
Intercept	−.06	0.05	−1.23	.219	−.00	0.05	−0.48	.962
PTSD symptoms	.38	0.05	7.22	<.001	−.01	0.06	−0.11	.909
Well-being	−.30	0.05	−5.80	<.001	.47	0.06	8.49	<.001
PTSD Symptoms x Well-Being	−.14	0.04	−3.49	.001	−.01	0.04	−0.14	.893

Note: $N = 318$. T0 = Time 0 (pretreatment).

not significantly predict levels of well-being at T1, $\beta = -.01$, $p = .893$.

Table 4 shows the outcomes of the explorative regression analysis with PTSD symptom clusters as the dependent variables. The most noticeable results were that T0 emotional well-being negatively predicted the severity of intrusions T1, $\beta = -.31$, $p < .001$; T1 avoidance, $\beta = -.35$, $p < .001$; and T1 hyperarousal, $\beta = -.24$, $p < .001$. Social well-being at T0 negatively predicted hyperarousal at T1, $\beta = -.13$, $p = .030$. The interaction between psychological well-being and hyperarousal at T0 predicted T1 severity of intrusions, $\beta = -.11$, $p = .008$, and T1 hyperarousal, $\beta = -.18$, $p < .001$. The interaction between psychological well-being and avoidance at T0 predicted levels of avoidance at T1, $\beta = -.12$, $p = .003$. These interactions indicated that treatment was more effective for participants with high levels of psychological well-being at T0, and this effect was stronger for patients with high levels of hyperarousal or avoidance at T0.

Table 5 shows the outcomes of the explorative regression analysis with dimensions of well-being as the dependent variable. The most noticeable outcome was the lack of significant associations between PTSD symptom clusters at T0 and dimensions of well-being at T1.

DISCUSSION

The present study was one of the first to examine changes in well-being among patients with PTSD receiving a care-as-usual treatment. The first aim of this naturalistic study was to assess levels of well-being before and after treatment for patients with PTSD. The findings showed that well-being increased significantly during treatment and that the strongest improvements were found in emotional and psychological well-being, but the effect sizes were small. The relatively small increases in well-being are in line with previous research that suggests well-being can increase but also has a stable component (Bartels, 2015; Schimmack et al., 2010; Sin & Lyobimirsky, 2009; Weiss et al., 2016). Even though the improvements in well-being were significant, the average level of well-being remained over 1 standard deviation below the general Dutch population's average level (Lamers et al., 2011). Moreover, although the number of participants characterized as flourishing increased from 9% to 19% overall, the number of those categorized as languishing following treatment was still 39%, which is almost 8 times higher than the rate found in in the general Dutch population (Schotanus-Dijkstra et al., 2016). This finding together with the high percentage of participants who still met the criteria for clinical levels of PTSD symptoms after treatment reveals that individuals with PTSD regularly continue to have substantial residual

TABLE 4 Stepwise regression analysis with pretreatment posttraumatic stress disorder (PTSD) symptom clusters, dimensions of well-being, and their interactions as predictors of posttreatment PTSD symptom clusters

| Variable | T1 | | | | | | | | | | | |
| | Severity of intrusions | | | | Avoidance | | | | Hyperarousal | | | |
T0	β	SE	$t(317)$	p	β	SE	$t(317)$	p	β	SE	$t(317)$	p
Intercept	−.04	.05	−0.85	.399	−.05	.05	−0.92	.359	−.07	.05	−1.37	.173
Severity of intrusions	.39	.05	7.88	<.001	.18	.06	3.02	.003				
Avoidance					.18	.06	2.92	.004				
Hyperarousal									.36	.05	6.95	<.001
EWB	−.31	.05	−6.41	<.001	−.35	.05	−6.58	<.001	−.24	.06	−4.10	<.001
SWB									−.13	.06	−2.19	.030
Avoidance x PWB					−.12	.04	−2.95	.003				
Hyperarousal x PWB	−.11	.04	−2.68	.008								
Hyperarousal x PWB									−.18	.04	−4.29	<.001

Note: $N = 318$. EWB = Emotional well-being; SWB = social well-being; PWB = psychological well-being

TABLE 5 Stepwise regression analysis with pretreatment posttraumatic stress disorder symptom clusters, dimensions of well-being, and their interactions as predictors of posttreatment dimensions of well-being

	Emotional well-being				Psychological well-being				Social well-being			
T0	β	SE	t(317)	p	β	SE	t(317)	p	β	SE	t(317)	p
Intercept	.00	.05	0.00	1.00	.00	.05	0.00	1.00	.00	.05	0.00	1.00
Emotional well-being	.31	.07	4.35	<.001								
Psychological well-being	.15	.07	2.09	.037	.46	.05	9.25	<.001				
Social well-being									.46	.05	9.14	<.001

Note: N = 318.

symptoms after treatment (Larsen et al., 2019; Resick et al., 2012). Several studies have demonstrated that low levels of well-being increase the risk of future incidence of mental disorders (Keyes et al., 2010; Lamers et al., 2015; Wood & Joseph, 2010); therefore, treatment aimed at decreasing PTSD symptoms and enhancing well-being should be encouraged for patients with PTSD.

The second study aim was to examine the association between changes in PTSD symptoms and well-being during care-as-usual treatment. We found that pretreatment levels of well-being were important factors to acknowledge for treating patients with PTSD. PTSD treatment was more effective when pretreatment well-being was high, and this effect was particularly strong for patients with high levels of PTSD symptoms at the beginning of treatment. This finding corroborates earlier research demonstrating that baseline well-being is beneficial in predicting the success of treatment in patients with chronic pain (Trompetter et al., 2017). The finding that well-being bolsters the effect of PTSD treatment for patients with high levels of PTSD symptoms suggests that rather than simply comprising an important life outcome, well-being can promote and sustain positive functioning. Patients with high levels of well-being might have more personal and social resources, which might enhance recovery (Ryff, 2014), and they may be more self-determined and engaged in therapy (Ryan & Deci, 2008). To increase recovery among patients with high levels of PTSD symptoms, pretreatment interventions aimed at increasing well-being could be warranted.

Emotional well-being at the start of the treatment negatively predicted the severity of intrusions, avoidance symptoms, and hyperarousal symptoms after treatment. These findings suggest that patients with PTSD recover faster when they are able to experience positive emotions in the aftermath of a traumatic event and support the broaden-and-build theory of positive emotions (Fredrickson, 2001). Positive emotions might also decrease the negativity bias imposed in reactions to trauma exposure (Cacioppo et al., 1999; Shmotkin, 2005) and decrease depressive symptoms among patients with PTSD, which might benefit treatment outcomes (Steiner et al., 2017). Although well-being and depression are related in patients with PTSD, these variables have also been shown to be distinct dimensions of mental health (Araujo et al., 2014; Keyes, 2005; Radstaak et al., 2000). The present findings did not replicate previous research indicating that emotional well-being affects hyperarousal more than active avoidance symptoms or intrusions (Giacco et al., 2013); therefore, no conclusions can be drawn about the association between emotional well-being and specific PTSD symptoms.

Psychological well-being and social well-being reflect the experience of meaning and purpose in life and are dif-

ferently related to PTSD symptoms than emotional well-being. In the present sample, social well-being predicted hyperarousal, suggesting the ability to function in society and within a community can cause patients with PTSD to feel less irritable, angry, and paranoid. Social well-being did not predict intrusions, and the associations between this component of well-being and the assumptive world need further examination (Freedle & Kashubeck-West, 2021). Psychological well-being was not directly related to PTSD symptoms nor was it shown to be associated with decreased avoidance. However, psychological well-being was found to act as a buffer against PTSD symptoms. Pretreatment PTSD symptoms were less strongly related to posttreatment PTSD symptoms among participants who reported relatively high levels of psychological well-being. These findings suggest that psychological well-being does not act as a direct antidote to the distress that patients with PTSD experience but that higher levels of personal and social resources enable patients with PTSD to better cope with their trauma and make them recover more successfully (Ryff, 2014).

PTSD symptoms and well-being were moderately related before and after symptom-focused treatment, and well-being predicted PTSD symptoms, whereas PTSD symptoms did not predict levels of well-being. These findings suggest that researchers can discriminate between well-being and psychopathology in psychiatric sample and replicate research among eating disorder patients in which moderate correlations have emerged between well-being and eating disorder symptoms (De Vos et al., 2018). Overall, the findings support the two continua models of mental health, which indicate that well-being and psychopathology are two related, yet distinct, dimensions of mental health (Keyes, 2005).

The present study had some important limitations. First, the dropout rate was high. More than 60% of the individuals who were invited to take part in the study did not complete all the questionnaires before treatment or at least one questionnaire following treatment. This high dropout rate may have biased the results. Participants who dropped out were, on average, 3 years younger than the included participants, but there were no differences in gender or symptom severity. This suggests that the sample was, in general, representative of a larger group of patients seeking treatment in a community mental health center. Second, 32.6% of the participants lost their diagnosis of PTSD following treatment. This percentage is lower compared with previous research (Blanchard et al., 2003; Ehlers et al., 2005; Schnurr et al., 2007). An explanation for this relatively low percentage is that the present study was naturalistic, and treatment was not standardized. A third limitation was that pretreatment PTSD was assessed using a cutoff score on a continuous measure rather than by conducting a structured diagnostic interview. Fourth, participants were included when they met the *DSM-IV-TR* criteria for PTSD instead of the current PTSD criteria in the fifth edition of the *DSM* (*DSM-5*). In past research, utilizing the *DSM-5* criteria for PTSD compared to the *DSM-IV-TR* has resulted in lower prevalence rates; however, the biggest difference in reported prevalence rates is 1.6% (Kilpatrick et al., 2013). A difference this small is unlikely to have significantly affected our outcomes.

On the other hand, the study had several important strengths, namely that it was conducted in a naturalistic setting under pragmatic conditions. Randomized controlled trials may overestimate effects because treatments are typically conducted under more favorable conditions and among more homogeneous samples (e.g., excluding comorbid disorders). The presence of comorbid disorders was unknown in this study, however, and needs further research.

This naturalistic study established that well-being increased among patients with PTSD who received a care-as-usual treatment and that the strongest improvements emerged for emotional and psychological well-being. Despite improvements in well-being, levels were still low overall compared to the general population. We found that well-being was an important predictor in treatment efficiency: Participants with relatively high levels of PTSD symptoms benefitted more from symptom-focused treatment when they experienced relatively high levels of well-being at the beginning of treatment. Emotional and psychological well-being affected treatment efficacy differently such that emotional well-being acted as an antidote to PTSD symptoms, whereas psychological well-being acted as a buffer against PTSD symptoms.

Based on the present findings, it would be beneficial to include a well-being measure, such as the MHC-SF (Keyers et al., 1998; Lamers et al., 2011), in routine outcome monitoring within mental health care (Bohlmeijer & Westerhof, 2020). Future research could explore the effectiveness of a pretreatment intervention that aims to increase well-being for patients with high levels of PTSD symptoms and low levels of well-being at the start of the treatment; this practice could potentially enhance the effectiveness of symptom-focused treatments for patients with PTSD. Second, the findings demonstrate that symptom-focused treatment for PTSD significantly improves well-being, yet a substantial number of patients continue to report levels of well-being that fall below the average in the Dutch population following treatment. This may be one important risk factor for the recurrence of PTSD (Keyes et al., 2010; Lamers et al., 2015; Wood & Joseph, 2010). Future research should examine the effectiveness of a treatment that specifically aims to enhance well-being for patients

diagnosed with PTSD, such as well-being therapy or positive psychotherapy.

OPEN PRACTICES STATEMENT

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