The efficacy of the BAMBOO program: A feasibility study

ABSTRACT

The aim of this study was to evaluate the effects of a culturally adapted positive psychology intervention (PPI) on resilience. In addition, the mediational effects of positive affect (PA) and negative affect (NA) are measured, as well as the moderation effects of age and residence status. A study was conducted among 95 multi-ethnic refugees at Dutch asylum seekers centers (ASCs). The participants were engaged in a 5-session prevention program: the BAMBOO program. Data were collected at baseline and post-intervention. Results revealed significant improvements in resilience (Cohen's d = .7), significantly mediated by negative affect. Positive affect did not mediate the relationship between the intervention and resilience. Age and residence permit had no moderating effect on post-intervention resilience. In conclusion, the BAMBOO program is a promising intervention to increase resilience.

Keywords: negative affect, positive affect, positive psychology intervention, resilience, refugees, cultural adaptation, feasibility study

INTRODUCTION

In recent years, a high increase in the number of refugees worldwide has been witnessed (de Graaff et al., 2020). In 2018, 13.6 million people were forcibly displaced all over the world, bringing the total number of refugees to 70.8 million **(**Acarturk et al., 2020). At the end of 2021, there were 125.663 refugees registered in the Netherlands (Centraal Bureau voor de Statistiek, 2022), with a further increase of 9.440 in the first quarter of 2022 (Immigratie- en Naturalisatiedienst, 2022). Apart from that, from March to May 2022 already 27.123 refugees from Ukraine came to the Netherlands (Ministerie van Algemene Zaken, 2022). A person is categorized as a refugee when that person is 'unable or unwilling to return to his country of origin owing to a well-founded fear of being persecuted' (de Graaff et al., 2020). Many refugees experienced traumatic events, such as bombings, threats, imprisonment, torture, injury, witnessing the death or injury of loved ones, multiple threats to life, loss of family, sexual and physical abuse, and lack of shelter or nutrition (Acarturk et al., 2022; Acarturk et al., 2021). In addition, they often faced a long and difficult journey, during which they had to overcome many obstacles and setbacks. Once they arrived in the Netherlands, refugees may face uncertainty about their asylum applications and are often confronted with the loss of social networks and worries about family. Moreover, they have to deal with discrimination, economic problems, and language barriers (Acarturk et al., 2022; de Graaff et al., 2020). As a consequence, they must find ways to cope both with the effects of prior exposure to potentially traumatic events and current stressors, while adapting to a new country and culture.

Due to the traumatic experiences, and the difficult journey in combination with post-migration stressors, refugees are more vulnerable to develop psychopathology (van Heemstra et al., 2019; de Graaff et al., 2020), even years after resettlement (Bogic et al., 2015). In the Netherlands, it is estimated that one in three refugees is suffering from depression, and one in three refugees is affected by an anxiety disorder (Acarturk et al., 2020; Graaff et al., 2020). The number of refugees with post-traumatic stress disorder (PTSD) differs from 15% up to 50% (Gwozdziewycs, & Mehl-Madrona, 2013; Graaff et al., 2020). Furthermore, comorbidity is high in this population, namely 16.3% for depression and anxiety and 15.7% for anxiety and PTSD (Acarturk et al., 2020). The prevalence of other mental disorders is less researched among refugees, but there are indications they have a risk of medically unexplained physical

symptoms, substance abuse, and attempted suicides, compared to non-displaced persons (Acarturk et al., 2020).

The increasing number of refugees with mental health problems creates high pressure on the Dutch mental health care system (Norredam et al., 2009; de Graaff et al., 2020). Consequently, the costs of Dutch health care are very high (Bloemen et al., 2021). Therefore, there is an urgent need for keeping these costs under control. Prevention in health care is often economical in cost reduction (Reenen et al., 2009), and therefore it could be beneficial to apply a preventive mental health intervention program to refugees. In contrast to preventive interventions, the focus on the treatment of refugees is mainly curative nowadays. Treatment is targeted at psychopathology, such as trauma or depression (Hendriks et al., 2020), aiming to reduce the symptoms of psychological distress, such as negative thoughts, feelings, and experiences (Cobb et al., 2019). Generally, four typically trauma-focused cognitive behavioral therapies (TF-CBT) are applied, namely prolonged exposure (PE), cognitive processing therapy (CPT), narrative exposure therapy (NET), and cognitive therapy (CT) (Thompson et al., 2018). These trauma-focused therapies aim to manage difficulties caused by traumatic experiences and combine cognitive and behavioral therapy. While PE is more focused on behavior by gradually confronting the patient with the trauma-related difficulties, CPT mainly targets changing trauma-related thoughts to modify emotions. NET works with the mechanism of telling the traumatic story until it no longer causes feelings of anxiety (Gwozdziewycz, & Mehl-Madrona, 2013), while cognitive therapy focuses more on changing present thoughts and thereby changing emotions and behavior. Another often used trauma-focused therapy is eye-movement desensitization and reprocessing (EMDR). In this therapy, the patient briefly focuses on the traumatic experience while simultaneously stimulating the brain to reorganize the memory (ter Heide et al., 2014).

Regarding their efficacy, a meta-analysis shows that only EMDR, NET (Thompson et al., 2018), CPT (Hinton et al., 2005), and TF-CBT (Hinton et al., 2004) tend to be effective for refugees in reducing symptoms of trauma. The efficacy of these Western treatment models related to the refugee population highly depends on the degree of cultural adaptation of the therapies (Thompson et al., 2018). The equivalence in the symptoms of PTSD differs substantially in different cultures (Hinton et al., 2005). CPT and TF-CBT were culturally sensitive by relating mindfulness to religion, applying relaxation exercises, and mobilizing positive emotions during times of trauma recall (Hinton et al., 2004). This is consistent with the trend of adding positive psychology to treatment methods for traumatized refugees nowadays. However, it must be taken into account that the basis on which conclusions are

drawn concerning the efficacy of these trauma therapies is small and that more research is needed (Tribe et al., 2019).

Positive Psychology Interventions

In recent years, therapies treating refugees with traumatic experiences often added preventive elements of positive psychology to their repertoire (de Graaff et al., 2020; Hendriks et al., 2021). In addition, there are positive psychology interventions (PPIs), that fully focus on positive psychology. These PPIs are aiming to increase positive feelings, behaviors, and cognitions (Schueller, & Parks, 2014), broaden the capacity of being productive and creative, build positive relationships, and solve problems, resulting in higher levels of well-being or happiness (Lely, 2010). These interventions are contrary to psychotherapy which focuses on treating psychopathology by countering negative thoughts of maladaptive behavior patterns.

Studies on the efficacy of PPIs are mostly conducted with samples that have characteristics of Western, Educated, Industrialized, Rich, and Democratic (WEIRD) populations (Henrich et al., 2010), which can lead to the conclusion that the research on PPIs in Western countries is less representative for several refugee populations (Henrich et al., 2010). Meta-analysis demonstrates that PPIs conducted in Western countries had a small effect on depression, and a small to medium effect on anxiety, and psychological well-being, while PPIs from non-Western countries indicate medium effect sizes on these constructs (Hendriks et al., 2020). This difference in efficacy can be partly explained by a lower methodological quality of studies in non-Western countries. Another explanation could be of cultural origin. In non-Western countries, certain elements of PPIs, such as gratefulness, optimistic thinking, and meditation, aren't stigmatized (Layous et al., 2011), contrary to psychotherapy, which is often stigmatized because psychological support is associated with the treatment of severe psychiatric illnesses in old-fashioned settings (de Jong, & Reis, 2010; Hinton & La Roche, 2013). People avoid this form of therapy, because they won't take the risk of becoming socially isolated, decreasing their chances of marriage, and losing their social status or income (Shannon et al., 2015). Applying PPIs could avoid this stigmatization of psychotherapy (Hendriks et al., 2021). Another cultural difference is the role of religion in non-Western countries. In the daily life of refugees spiritual activities, such as prayer and meditation, are important aspects. These activities are integrated into PPIs. A further aspect of PPIs that differs from Western countries is the element of cultivating positive states with low arousal (calmness, harmony, and relaxation). Also, non-Western countries are more focused

on the community and the social aspect (Darwish & Huber, 2003), which is a substantial element of PPIs. In sum, the higher effectiveness of PPIs in non-western countries may be attributed to the cultural sensitivity of the programs. In addition, research suggests that developing trauma is influenced by ethnopsychology, religion, and spirituality (Hinton, & Good, 2016). Therefore, it would be even more plausible to implement these cultural phenomena in refugee-oriented interventions.

Resilience

Resilience is a multifaceted construct, often defined as the capacity to cope successfully with adversity and stress (Luthar et al., 2000; Zautra et al., 2008), and to bounce back after negative emotional experiences (Tugade, & Frederickson, 2004).
Resilience can also be characterized as an individual psychological trait or a multi-dimensional process. This process is conceptualized by individual characteristics, family attributes, and environmental support systems (Garmezy, 1993; Rutter, 1987; Werner, 1993). Socio-economic, cultural, and historical factors, for instance, average income or tradition are also influencing resilience (Gunderson, 2010; Hobfoll, & de Jong, 2014). An important individual influence on resilience is stress coping ability, such as action orientation and humor. Stress coping ability is often used as a measure of resilience (Seery et al., 2011; Connor, & Davidson 2003). Moderate stress can positively influence resilience (Seery et al., 2011), in contrast to severe stress which can diminish resilience (Connor, & Davidson 2003). Other individual aspects that build resilience are optimism, hope, social skills, and positive self-concept (Hutchinson, & Dorsett, 2012; Luthar et al., 2014). In contrast, individual factors that decrease resilience are internalizing and externalizing problems (Seery et al., 2011). Internalizing problems take place within the individual itself while externalizing problems have environmental consequences. These individual characteristics interact with the social environment which in turn can influence the level of resilience. Refugees often have problems communicating, causing isolation and less integration, which can lead to more violence in the community (Hutchinson, & Dorsett, 2012). Other resilience-threatening phenomena often experienced are racism and discrimination against refugees, as well as the bias of labeling refugees in advance as persons with a psychopathological disease (Seery et al., 2011). These aspects should be taken into account when working on resilience with refugees. Resilience-orientated PPIs can be promising for increasing their well-being. At an earlier stage, the American Psychological Association has drawn guidelines to develop resilience, which was the basis of a Shell Resilience Program applied in 53 countries to employees. A study

examining this program concluded a significant increase in resilience (Hildering van Lith, 2015). This adaptive program, in turn, provided the foundation for a five-session structured culturally sensitive intervention, namely the Strong Minds Suriname program (SMS) that aims to increase resilience (Hendriks et al., 2020). A study on the efficacy reveals large significant improvements among 158 employees in Suriname considering resilience, mental well-being, negative affect, depression, positive affect, and anxiety (Hendriks et al., 2020). Another PPI focused on strengthening resilience is the Strengths For the Journey (SFJ), which entails a short group-based intervention for children in a refugee camp on the island of Lavos in Greece (Foka et al., 2019). SFJ is a six-day program with a daily changing subject.

However, the outcomes of these intervention studies cannot be generalized to the refugees in The Netherlands, because the target group of these interventions didn't include adult refugees. Especially for refugees in the Netherlands, a resilience-focused program has been developed, namely the BAMBOO program (Bloemen, 2021). This PPI is a mental health care [GGZ]-prevention program, currently being executed at more than 50 asylum centers (ASCs) throughout the Netherlands (Hendriks et al., 2021).

Present study

The main goal of this study is to examine the impact of the intervention on resilience. Furthermore, the possible mediation effects of positive affect (PA) and negative affect (NA) are investigated. Age and residence permit are examined as potential moderators.
Concerning the main goal of this study, the intervention is characterized by resilience-related aspects, such as positive and negative emotions, gratitude, and goal setting. The program is adapted to the cultural background of the participants, and is based on the SMS program which was effective in increasing resilience. Therefore, the research question is whether the BAMOO program increases resilience in refugees at ASCs.

Hypothesis 1

The resilience of refugees at ASCs increases after participation in the BAMBOO program.

PA can be described as the extent to which a person feels active, enthusiastic, and alert (Tugade, & Fredrickson, 2004), leading to a higher level of attention and cognition, which stimulates creative problem solving and flexible thinking and increases the level of well-being (Meyers, & van Woerkom, 2017). According to the Broaden and Build Theory (Fredrickson, 2001), this mechanism of solving problems and flexible thinking could be seen as resilience, since it is measured by stress coping ability (Connor, & Davidson, 2003). Therefore, the

second research question is whether there is a mediating effect of PA between the intervention and resilience.

Hypothesis 2

The resilience of refugees at the ASCs increases through PA after taking part in the BAMBOO program.

A person with NA can be characterized as apathetic and aversive (Sanmartín et al., 2018). When NA increases, the repertoire to cope with stress decreases (Tugade, & Fredrickson, 2004). In contrast, resilience leads to lower levels of negative emotions (Wingo et al., 2010; Shin et al., 2019). Therefore, the third research question is whether there is a mediating effect of NA between the intervention and resilience.

Hypothesis 3

The resilience of refugees at the ASC decreases through NA after taking part in the BAMBOO program.

Literature suggests that across the lifespan there is a small variation in resilience (Portzky et al., 2010), resulting in more creative and conscientious thoughts about well-being at a certain age (Hayman et al., 2016). Therefore, the fourth research question is whether there is a moderating effect of age.

Hypothesis 4

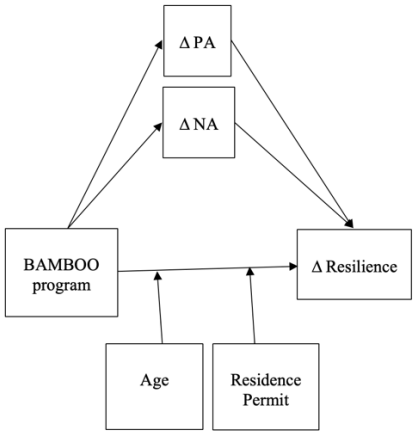
The effect of the BAMBOO program on the resilience of refugees in the ASCs is moderated by age.

A temporary residence permit is associated with higher scores in irregulated mood and anxiety (Bogic et al., 2012), which can influence resilience. Therefore, the fifth research question is whether there is a moderating effect of residence permit.

Hypothesis 5

The effect of the BAMBOO program on the resilience of refugees in ASCs is moderated by residence permit.

Figure 1. Hypothesized moderators and mediators for the BAMBOO program effects on resilience of refugees.



METHODS

Design

The feasibility of the BAMBOO program was examined by an observational study with a cohort design. This feasibility study is needed, considering the novelty of the program. The study has been used to determine the potential obstacles and viability of this resilience-strengthening intervention, thereby saving time and costs (Shawn Green et al., 2019). Resilience, PA, and NA were selected as outcome measures.

Participants and procedure

In this study, pre- and posttest assessments of 95 Participants (n = 95) were included. To select the sample, the following criteria have been applied: 1) asylum seekers of 18 years and older, 2) residing at an ASC, and 3) able to speak Farsi, Arabic, Tigrinya, Turkish, Kurmanji, Dari, or English. Participants were recruited by the trainers of the BAMBOO program and the colleagues of the Central Institute for Asylum seekers [*Centraal Orgaan Asielzoekers]* (COA). The intervention sessions took place at more than 50 COA locations. Data were collected by the trainers at the beginning of the first session and at the end of the last session of the program. The participants filled in the questionnaires on paper.

Inclusion took place from February 2021 until May 2022. All participants were informed about the intended goal of the program. Participation in the study was voluntary. All participants signed an informed consent before participating. To ensure anonymity, a personal code was created for each participant. Ethical approval has been obtained from the ethic review board of Tilburg University (RP381).

Intervention

BAMBOO is a culture-sensitive mental health care prevention program aimed at increasing well-being and resilience, developed in 2019 on the basis of a resilience-enhancing program, namely the SMS program (Hendriks et al., 2020). The program is called BAMBOO because bamboo is strong and very bending and therefore symbolizes resilience. The program consists of five weekly two-hour sessions in a group of six to ten participants (Bloemen, 2021). Each meeting focuses on a specific theme, namely resilience, emotions, strengths, gratitude, and goal setting.

The training is adapted to the cultural background of the participants, taking into account narrative expression, the focus on feelings instead of thoughts, joint exercises, the

attention to physical problems, and the use of religious and spiritual practices. The training is offered to three age groups in several languages at different ASCs. The BAMBOO program is available for adults from 18 years old, for youth between 12 years old and 17 years old, and for children between 6 years old and 11 years old. The program is conducted in Farsi, Arabic, Tigrinya, Turkisch, Kurmanji, Dari, and English. The trainers are general practice-based nurse specialists [*praktijkondersteuners huisartsenzorg geestelijke gezondheidszorg]* (POHs-GGZ) and nurses. POHs-GGZ work for general practitioners and focus on the psychological and psychosocial problems of patients. The trainer is assisted by an interpreter. Furthermore, a training manual was developed to standardize the training and the trainers were educated to implement the BAMBOO program. All participants receive a workbook.

Measures

The test battery consisted of the Connor Davidson Resilience Scale (CD-RISC-10), the *International Positive and Negative Affect Schedule, Short Form* (IPANAS-SF), and the Visual Analogue Happiness Scale (VAHS). At posttest, a 5-item satisfaction questionnaire was also included. The VAHS and the satisfaction questionnaire are not used for this study. All questionnaires were available in Farsi, Arabic, Tigrinya, Turkisch, Kurmanji, Dari, and English.

CD-RISC-10 (Connor, & Davidson, 2003) was used to measure the resilience of the participants. The scale consists of 10 items on how respondents would cope with certain situations, (e.g., '*I am able to adapt to when changes occur.*'). Each item is rated on a 5-point scale from 1 (not at all true) to 5 (almost always true), with a higher score reflecting greater resilience. Cronbach's alpha in the present study at the pretest was $\alpha = .900$, and at the posttest $\alpha = .873$.

IPANAS-SF was used to measure positive and negative emotions right before the first session and right after the last session of the program. The IPANAS-SF included 10 items, 5 items to measure PA, and 5 items to measure NA (e.g., *'In general, I feel alert'*) (Sanmartín, 2018; Thompson, 2007). Items on the IPANAS are rated on a 5-point scale from 1 (*little, or not at all*) to 5 (*very much*). The outcome scores reflected to what extent someone experienced NA and PA, with a low score meaning little NA or PA and a high score meaning many NA or PA. Cronbach's alpha of the subscale PA at the pretest in the present study was $\alpha = .720$, and for the subscale NA $\alpha = .755$. Cronbach's alpha at the posttest was for PA $\alpha = .682$, and for NA $\alpha = .730$.

Statistical analysis

SPSS Statistics version 20 was used to perform a paired t-test, mediation-, and moderation analyses. The paired t-test was used to calculate the differences between T1 and T2 on outcomes in resilience before and after the BAMBOO program. In this analysis, resilience at pretest is the independent variable, and resilience at posttest is the dependent variable. Prior to conducting the paired t-test, data were checked for normality and outliers, and outliers were removed from the analysis. Missing data were imputed via multiple imputations. The test was two-tailed, the significance threshold was set at < .05, and the effect size (Cohen's *d*) was calculated for completer analysis. Prior to conducting the moderation and mediation analyses, the assumptions of multiple linear regression, i.e., normality, outliers, linearity, homoscedasticity, uncorrelated residuals, multicollinearity, and appropriate scale properties are tested. A 95% CI or a $p < 0.05$ is used to determine the significance of the outcomes. To test whether PA or NA mediates the relation between the BAMBOO program and resilience, mediation analyses were executed, with PA and NA as mediators. These mediation analyses are performed using model 4 of the PROCESS tool in SPSS, version 3.0 (Hayes, 2013). The independent variable was the pretest scores of resilience, the dependent variable was the posttest scores of resilience, and the mediators were PA and NA. PA and NA were added simultaneously to the regression models and unstandardized regression coefficients were given for each path.

The assumption of linearity was not met for both age and residence permit, and the moderation analysis couldn't be executed. A multiple regression analysis was used to test the assumptions, in which the independent variables were age and residence permit and the dependent variable was the score on resilience at the posttest.

RESULTS

Demographics

The mean age of the participants was 35.4 years (SD = 9.9 years) and 73,7% were male and 26% were female (Table 1). The participants originated from Syria (36%), Iran (10%), Iraq (8%), Eritrea (7%), Afghanistan (14%), and Yemen (11%), and 1 To 4% from Palestine, Egypt, Uganda, Taiwan, Morocco, Sudan, or Armenia (Table 2). The majority of participants were religious, in particular Islam (74%), Christianity (14%), Judaism (3,2%), and Druze (2,1%). A small group of the participants had other religions (1%) or were not religious (6%). 53% Of the participants had a permanent residence permit, and 47% had a temporary residence permit.

Table 1 Descriptive statistics of gender, country of origin, religion, and language

Descriptive Statistics

	N		N
Country of origin		Religion	
Syria	34	Islam	70
Iran	9	Christianity	13
Iraq	8	Judaism	3
Eritrea	7	Druze	2
Afghanistan	13	None	6
Yemen	10	Other	1
Palestine	4	Language	
Egypt	4	Arabic	63
Uganda	1	Farsi	21
Taiwan	1	Tigrinya	7
Morocco	2	English	4
Sudan	1	Gender	
Armenia	1	Male	70
		Female	25

Table 2 Descriptive statistics of age, status, PA, NA, and resilience (T1-T2)

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Age	95	35.38	9.9	17	60
PA_T1	95	3.37	.87	1.40	5.00
PA_T2	95	3.57	.65	1.40	5.00
NA_T1	95	2.43	.78	1.00	4.20
NA_T2	95	2.16	.73	1.00	4.20
Resilience_T1	95	2.45	.76	.26	3.80
Resilience_T2	95	2.88	.67	1.30	5.00

Drop out

From March 2021 to May 2022, there were 388 applications of which 282 (73%) started the first session. 203 (52%) Participants completed the program, divided into 45 groups. The pre-test was conducted on only 160 (41%) of the participants, and the posttest was conducted on 99 (26%) participants, which resulted in 95 (24%) complete data sets.

Main effect

A paired-samples t-test was conducted to determine the effect of the intervention on a resilience test score. The assumptions of normality and outliers for performing analysis were met. In table 2, the results are shown. The results indicate a significant difference between the resilience test score before the intervention (M=2.45; SD =.76*)* and the resilience test score after the intervention (M=2.88; SD =.66); [t(92) = -5.303, p = <.001]. The 95% confidence interval of the difference between the means ranged from [-.55 to -.25] and indicated a difference between the means of the samples. The effect size is shown in Table 3 (Cohen's *d* = .7), which indicates a medium effect. Therefore, the null hypothesis that there is no difference between the means is rejected and it can be concluded that there is an impact of the intervention on the resilience test score. Furthermore, the descriptive statistics of all the variables used in the analysis are listed in table 1.

Table 2 Results from paired sample t-test for effects of the intervention (BAMBOO) on resilience

Paired Samples Test[a]

	Paired Differences							Significance
				95% Confidence Interval of the Differences				
	Mean	Std. Deviation	Cohen's d	Lower	Upper	t	df	Two-Sided p
Resilience T 1 – Resilience T2	-.40	.72	.72	-.55	-.25	-5.30	92	<.001

Mediation analyses

Multiple mediation analyses are performed and the results on resilience are shown in Tables 4 and 5. Figure 2 shows the unstandardized regression coefficients on changes in resilience, respectively. Coefficients of the a-paths on the resilience of the posttest were significant for PA ($p < .001$), and also for NA ($p < .05$). This suggests that the BAMBOO program did not lead to changes in PA and NA. PA 27 c' sign <0.05 and NA significant <0.05. Considering the b-path, PA did not significantly change resilience in the posttest ($p = .27$) and NA did significantly change resilience in the posttest ($p < .05$). When only measuring the level of resilience of the pre-test on the resilience of the posttest, it was significant ($p < .05$). When adding the mediators to this effect, the c'-path, its effect was still significant ($p < .001$). After including the mediators, the effect on resilience was larger. The BC 95% CI of the specific indirect effect for PA on resilience did contain zero (*ab* = .04, BC 95% CI = -.03 to .13), while for the indirect effect of NA on resilience it did not contain zero (*ab* = .05, BC 95% CI = .01 to .11). This suggests that PA is not a significant mediator for resilience, whereas NA is a significant mediator for resilience. The total model explained 49% of the variance in the resilience of the posttest.

Table 4b Results from the multiple mediation analysis for effects of PA and NA on the interaction between the intervention (BAMBOO) and resilience

Mediators	a	b	Total effect c	Direct effect c'	Indirect effect a x b (95% CI) a
PA	.69***	0.04 ns	.25**	.45***	-.10(-.03-.13)
NA	-.47**	0.05**	.25**	.45***	.10 (.01-.11)

Notes: *p < .05, **p < .001, ns = not significant

Table 5 Explained variance of the model including the mediators PA and NA for the multiple mediation analysis

Model summary

R	R-sq	MSE	F(HC3)	df1	df2	p
.49	.24	.27	8.98	3	88	.000

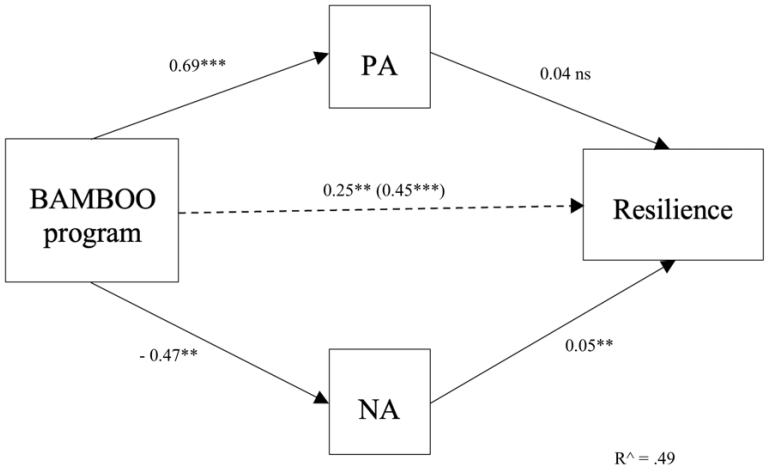
a. outcome variable: Resilience T2

Table 6 Coefficients of the model including the mediators PA and NA for the multiple mediation analysis

Model

	Coeff	Se(HC3)	t	p	LLCI	ULCI
Constant	2.29	.37	6.15	.0000	1.55	3.03
R_T1_to	.25	.09	2.82	.0059	.07	.43
PA_tot	.06	.05	1.10	.2745	-.05	.17
NA_tot	-.10	.05	-2.12	.0366	-.20	-.01

Figure 2 Multiple mediation PA and NA as mediators of the effect of the BAMBOO program on resilience (T1-T2). The total effect (c-path) is given in parentheses. *<.05, **<.01, ***<.001, ns = not significant



Moderation analyses

To perform a moderation analysis, the assumptions of multiple linear regression were tested (Table 6). Both moderators didn't meet the assumption of linearity, therefore the moderation analysis couldn't be executed. Instead, age and residence permit were investigated as independent variables. Age did not have a significant effect on resilience after the program, $F(91) = .017$, $p < .897$. Residence permit did not have a significant effect on resilience after the program, $F(91) = .918$, $p < .403$. Therefore, the hypothesis of the moderation effects of age and residence permit on the interaction between the BAMBOO program and resilience could not be tested. The non-significant coefficients of age and residence permit on the posttest of resilience are listed in Table 7.

Table 7 Results of multiple linear regression of the effect of age and residence permit on resilience posttest

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.01	1	.01	.17	.678[b]
	Residual	32.97	91	.36		
	Total	32.98	92			
2	Regression	.66	2	.33	.92	.403[c]
	Residual	32.32	90	.36		
	Total	32.98	92			

a. Dependent Variable: Resilience T2

b. Predictors: (Constant), Age group

c. Predictors: (Constant), Age group, Status

Table 8 Coefficients of the effect of age and residence permit on resilience posttest in multiple regression analysis

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.94	.17		17.35	<.001
	Age group	-.03	.07	-.04	-.42	.68
2	(Constant)	3.13	.30		10.26	<.001
	Age group	-.00	.01	-.02	-.23	.82
	Status	-.17	.13	-.14	-1.35	.18

a. Dependent Variable: Resilience T2

DISCUSSION

This feasibility study aimed to examine the efficacy of the BAMBOO program for increasing resilience in refugees. The findings indicated a direct increase in resilience with a medium effect size. The results of this study are consistent with previous studies examining the effects of PPIs on resilience in non-refugee populations. For example, the program on which BAMBOO is based, the 5-session SMS program, demonstrated large effects on resilience (Hendriks et al., 2019). These positive outcomes are also comparable to a pilot study on a 4-week resilience intervention for 30 college students, through enhancing coping strategies, decreasing symptomatology, and enhancing protective factors, such as positive affect and self-esteem (Steinhardt, & Dolbier, 2008). Nevertheless, these psychological domains are more individually focused, while the domains of the BAMBOO program are more collectively oriented. Previous studies on PPIs for refugees have shown positive results. For example, the SFJ program shows significant results in well-being, self-esteem, optimism, and decreasing depressive symptoms in 31 refugee children in a refugee camp (Foka et al., 2019). Another study among 49 refugees with psychopathology that examined the effects of the 7ROSES intervention reported a significant increase in self-efficacy and mental health (van Heemstra et al., 2019).

The moderate effect size on resilience through the BAMBOO program may be explained by characteristics of the program such as the cultural sensitivity and the resilience-increasing elements of the program. Research shows that culturally sensitive interventions targeted at a specific cultural group are more effective than interventions provided for groups with various cultural backgrounds (Griner, & Smith, 2006). Examples of these cultural adapted and resilience-increasing characteristics are exercises with the focus on positive emotions in the module emotions and gratitude, exercises with the focus on meaning and accomplishment in the module training on goal-setting, and group-based exercises with the focus on relationships.

Furthermore, the study tested the mediational effect of PA and NA on the relation between the BAMBOO program and resilience. The results indicate a significant mediation effect of NA, which is also in line with the expectations of a decrease in NA being related to an increase in resilience. In several studies, the relationship between resilience and NA is found. Research shows that NA leads to a smaller repertoire to cope with stress (Tugade, & Fredrickson, 2004), which could be seen as resilience, and resilience leads to lower levels of NA (Samani et al., 2007; Wingo et al., 2010; Shin et al., 2019). With regard to the effect that

wasn't significant in this study, namely the mediation effect of PA, there are several explanations. Firstly, affective states can fluctuate from one moment to the next depending on situational factors (Watson et al., 1988). In this fluctuation there is a difference between NA and PA, where PA is more sensitive to environmental factors than NA, resulting in a more fluctuating PA (Tugade, & Fredrickson, 2004; Sanmartín et al., 2018). The situational fluctuation of PA makes it harder to be influenced in the long run. This is consistent with the research where PA had a significant effect on resilience (Tugade, & Fredrickson, 2004), but the effect was measured within minutes, whereas in this study, the effect is measured for 1,5 months. Another explanation is the methodological limitations of the small sample size, by which the risk on random elements is higher and the reliability is less. Apart from the fluctuating states of PA, there is no consensus in the literature on whether PA influences resilience (Zautra et al., 2005).

Furthermore, the moderation analysis could not be conducted, because the assumptions for a moderation analysis were not met. Age was investigated as an independent variable and in contrast to what was expected, age didn't have an effect on resilience in this study. A possible explanation could be the broad age range in the sample of the present study, because in another study an effect was only found in people from 85 years old (Hayman et al., 2016). This age category wasn't included in the study of the BAMBOO program. In contrast, a comparable study with Western participants found a small effect of age on resilience (Portzky et al., 2010). Furthermore, residence permit was also investigated as an independent variable and did not predict resilience either. There was a relationship expected between residence permit and resilience, because residence permit has an effect on PTSD, mood, and anxiety disorder (Bogic et al., 2012). It should be noted, however, that in the present study of the BAMBOO program the participants weren't selected for these disorders. Therefore, it is questionable, if the extent of prevalence of participants with disorders mentioned above is substantial to be able to measure a relationship between residence permit and resilience.

Limitations and strengths

The first limitation contains the absence of a control group. Thereby, the role of random influencers, the group impact, or the possible natural recovery process couldn't be identified, which could lead to less reliability and smaller effect sizes (Scriven, 2008). However, a possible natural recovery from traumatic experiences is not obvious, because most refugees remain sensitive to psychopathology (Bogic et al., 2015). According to research, complaints concerning traumatic experiences even increase when refugees have to

wait a long period to receive the asylum application decision (Hvidtfeldt et al., 2020). This psychopathological sensitivity also tends to increase in the face of post-migration stressors (Laban et al., 2004). The second limitation pertains to the selection bias (Heckman, 1990), occurring when the participants in the sample aren't representative for the whole population, due to the selection method of voluntary registration. This voluntary registration may lead to a sample of participants with a relatively high level of resilience, due to the probability that people who are depressed and low resilient, may not register (Geelen, 2010). The consequence is a ceiling effect, occurring when the program isn't challenging enough for the already high levels of resilience. As a result, substantial proportions of individuals obtain in the pre-test already either maximum or near-maximum scores, which means the true extent of their abilities cannot be determined (Wang et al., 2008). This ceiling effect can lead to inaccurate results in most data analyses. In practice, the program could be more effective for the general population. A third limitation pertains to the use of different trainers in the BAMBOO program, with different work experiences related to refugees and with different training skills, while studies suggest experience plays a central role in models of work performance and behavior (Tesluk, & Jacobs, 1998). Depending on the level of experience and training skills, the results could be influenced by the trainers. Furthermore, the use of interpreters who translate the exercises could have led to interpreting bias and to less reliability (Hoogsteder, & Dias, 2016). The fourth limitation is the relatively long period of collecting data, which leads to more vulnerability for uncontrollable extern influencers (Rumsey, 2016). For example, the Covid-19 crisis may have caused a decrease in the level of resilience (Yildirim, & Solmaz, 2020). This could have influenced the scores in the BAMBOO program by decreasing or increasing the resilience of the participants, resulting in less reliable outcomes. The fifth limitation is the lack of a follow-up test, which means that conclusions can't be drawn for long-term effects. A sixth limitation pertains to the lack of a timeline of the mediators, which is an essential requirement to demonstrate the effect of a mediator (Kazdin, 2007, 2009). Thereby, PA or NA isn't measured before resilience, which means that it cannot be ensured that PA or NA changed before resilience changed. So, a definite causal relationship between NA and resilience cannot be drawn. The seventh limitation concerns the biases of the measures related to the cultural background of the participants. For instance, the tendency of people who originate in a collective culture, to give more socially desirable answers (Papadopoulos et al., 2012), does not match their actual state of resilience. In addition, talking about mental health problems is taboo in these cultures (Middleton, & Jones, 2000). The taboo around mental illness and the fear of repercussions

may cause an incongruent attitude of pretending to feel better avoiding negative consequences. This may lead to inadequate scores on the tests. Other cross-cultural biases that may occur are construct bias, containing an incomplete identity of a construct across different cultural groups or an incomplete overlap of behaviors associated with the construct (van de Vijver, 2010), and item bias, referring to anomalies in the item level. Nevertheless, the possible influence of these biases in this study is decreased, because of the use of culturally sensitive questionnaires.

One particular strength of this study was the cultural adaptation of the program. The program was based on the culturally adapted SMS program (Hendriks, de Jong, 2019), and the adaptation was further enhanced by adjusting the program to two core elements that refugees have in common. First, the number of group-based exercises is considerably larger than the number of individual exercises, which is in line with the characteristics of the collective cultural background of the refugees (Hendriks, de Jong, 2019). Second, religion is an important source of resilience and well-being in non-western countries (Hendriks, de Jong, 2019). In the program, this religious aspect is designed by exercises of gratefulness expressed through prayer. Moreover, to consummate the cultural adaptation of the program, the four phases model of cultural adaptation (Barrera & Castro, 2006) were applied.

The second strength of the study was the use of validated questionnaires. Research examined the validity and reliability of the CD-RISC, the questionnaire measuring resilience (Ssenyonga et al., 2013). Research applied psychometric analysis to validate this 10-item unidimensional scale, and demonstrated good internal consistency and construct validity (Campbell-Sills, & Stein, 2007). Overall, the 10-item CD-RISC displays excellent psychometric properties and allows for efficient measurement of resilience. Another study that examined the CD-RISC shows that the measure has sound psychometric properties and distinguishes between those with greater and lesser resilience (Connor, & Davidson, 2003). Furthermore, the study also indicates the modifiability of the resilience scale. Also, in previous studies with refugees, the 10-item IPANAS's psychometric properties were examined. The cross-sample stability, internal reliability, temporal stability, cross-cultural factorial invariance, and convergent and criterion-related validities were found to be psychometrically acceptable (Thompson, 2007). Another large study used the IPANAS-SF and noted that the questionnaire was culturally sensitive (Sanmartín et al., 2018). Besides that, the IPANAS-SF is used in other studies with refugees (Tip et al., 2020).

Conclusion

This feasibility study demonstrates the plausible efficacy of the BAMOO program on resilience. In contrast to PA, possibly due to the sensitivity to influences, this study also demonstrates a plausible mediation effect of NA on resilience. The possible moderation effects of age and residence permit could not be tested, because the assumption for moderation analyses was violated.

Recommended is a randomized or quasi-experimental study of the effect of the BAMBOO program on resilience with a follow-up. In future research, it is important to use a control group to rule out random influential factors. Furthermore, to conclude on the effects of mediators, measurement of the potential mediators should be conducted before the outcomes. If such a study concludes that the BAMBOO program increases resilience, the use of this program could prevent psychopathological problems in refugees, which will release pressure on Dutch mental health care.

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