



BAMBOO for Refugees—A Culturally Sensitive Positive Psychology Intervention: A Protocol for a Pilot Randomized Controlled Trial

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Abstract

This protocol investigates the efficacy of a mental health and psychosocial support (MHPSS) program named BAMBOO. The goal of this program is to increase resilience and mental well-being among refugees. In recent years, there has been an increasing number of refugees fleeing to Europe and applying for permanent residence. In the Netherlands, a wide variety of programs that focus on increasing mental well-being among refugees is available. BAMBOO is a strengths-based intervention, which consists of five weekly two-hour group-based sessions. It is based on the theoretical framework of positive psychology and adapted according to the guidelines for the implementation of culturally sensitive cognitive behavioral therapy among refugees. The program does not focus on the treatment of trauma, mental disorders, or underlying problems, but aims to increase factors such as personal strengths, positive emotions, positive relations, and self-esteem. The first version of the program (BAMBOO 1.0) has been conducted at over 50 asylum centers in the Netherlands since January 2020. In the time period from September 2020 to September 2022, qualitative and quantitative data were collected among BAMBOO trainers and participants and the program was adapted, leading to a revised version (BAMBOO 2.0). A single-blinded parallel pilot randomized controlled trial, with an intervention group and awaiting list control group, with 34 participants per group will be used to test the program's efficacy. Outcomes include resilience, satisfaction with life, positive and negative affect, and self-esteem. The study will be conducted among adult Arabic speaking refugees, residing at an asylum center in the Netherlands and/ or in a Dutch municipality. Baseline, post-intervention, and five-week follow-up assessments will be conducted. This paper describes the protocol for the evaluation of a novel and culturally adapted program. The study will shed light on the efficacy of a culturally sensitive strengths-based intervention as a preventive approach to increase refugee well-being. ERB Tilburg University, TSB RP623.

Keywords Refugees · Well-being · Resilience · Positive psychology intervention · Cultural adaptation · Strength-based intervention

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1 Introduction

The global refugee crisis of the past decades had a large impact on the lives of tens of millions of displaced people, and on the countries that harbor them. The past decade, the annual number of refugees applying for permanent residence in the Netherlands has been fluctuating between 10.000 and 43.000, with an estimated average of 19.000 refugees per year (CBS, 2022). Studies consistently show that refugees are at a high risk of developing common mental disorders as a result of traumatic experiences (Bogic et al., 2015; Fazel et al., 2005; Hou et al., 2020). Such experiences may have detrimental effects on the physical and mental health of the refugees involved, as demonstrated in a recent meta-analysis that reported that up to one in three refugees experience mood disorders and post-traumatic stress disorders, and one or two out of 10 refugees suffer from an anxiety disorder (Henkelmann et al., 2020). Many refugees do not receive the help they need due to various barriers, such as language and communication problems, unfamiliarity with the availability and access to healthcare, lack of trust in public health institutions, fear of stigmatization, and long waiting lists (Morris et al., 2009; Priebe et al., 2016; Satinsky et al., 2019). Traditionally, available programs to increase refugee well-being focused on treatment of trauma, and were mostly based on cognitive behavioral therapy (Thompson et al., 2018). Although the prevalence of PTSD and other psychological problems among refugees is relatively high, mental well-being is more than the mere absence of pathological symptoms (Westerhof & Keyes, 2010). In regard to mental health and psychosocial support (MHPSS) programs for refugees, we recently have seen a shift from trauma-focused interventions to community -and strengths-based interventions (Greene et al., 2022). The latter do not focus on the treatment of trauma and pathological symptoms, but rather on developing personal qualities such as self-efficacy, social problem solving, sense of purpose, hope, and resilience (Liu et al., 2020; Tse et al., 2016). Examples of such programs that are available for refugees in the Netherlands are *Mosaic*, a six-session program, which aims to increase well-being and labor market participation of Syrian and Iraqi refugees (Fahham et al., 2020), *7 ROSES*, a nine-session program that focuses on developing coping resources and skills to tolerate or to change negative circumstances (van Heemstra et al., 2019), and *Self-Help Plus*, a five-session program which focuses on accepting negative emotions, fostering compassion, and practicing mindfulness (Epping-Jordan et al., 2016). Another example is the *BAMBOO* program, a five-session program that aims to increase factors such as personal strengths, positive emotions, positive relations, and self-esteem (Hendriks & de Jong, 2021).

The *BAMBOO* program (version 2.0) is the subject in this current study. Firstly, the origins and the theoretical framework of the program are explained, followed by a description of the process of cultural adaptation that the program went through. Secondly, the methodological aspects of a pilot randomized controlled trial will be described.

2 BAMBOO 2.0: A Strength-Based Prevention Program

2.1 Background

In the Netherlands, the Central Agency for the Reception of Asylum Seekers, or COA (Centraal orgaan Opvang Asielzoekers), is responsible for the reception, support, and guidance of refugees. Refugees are temporarily housed at COA asylum centers (AZCs), of which there are currently (December 2023) over 80 located across the country (excluding temporary emergency locations). GZA healthcare (GZA) is responsible for the physical and mental healthcare of refugees at these locations. In 2019, this organization was commissioned by the COA to implement a new mental health care program. At that time, available mental healthcare programs for refugees were mostly based on cognitive behavioral therapy (van Herpen et al., 2018). The length of these programs was usually between seven and twelve sessions and had to be conducted by highly educated and trained healthcare professionals (e.g., clinical psychologists, psychiatrists). As a result, they lacked scalability, due to high personnel costs and limited availability of trainers at remote areas in the Netherlands, where many asylum centers are located. Furthermore, the available programs focused on psychological problems and treatment of trauma, which increased the threshold for refugees to participate in such programs, due to fear of stigmatization (Shannon et al., 2015). As a result, only a limited number of refugees attended the mental health care programs that were available at reception centers. Affordability and scalability have become focal points for interventions among refugee populations (Bryant, 2023; Murray & Jordans, 2016). For these reasons, a new program had to adhere to the following requirements: i) consisting of a maximum of five sessions; ii) focusing on resilience and wellbeing, not trauma; iii) deliverable by a broad scope of health care professionals, including non-clinical psychologists, general practice nursing specialists (POH GGZ), psychiatric nurses, and local lay providers. Since at that time no available programs met these criteria, GZA decided to adopt and adapt an existing program, which became BAMBOO.

2.2 Theoretical Framework and Content of the Program

BAMBOO (version 2.0) is a cultural sensitive strengths-based intervention. It is built on the theoretical framework of positive psychology (Seligman & Csikszentmihalyi, 2000). In the field of positive psychology, one of the main pillars is the study of characters strengths, universal positive personality traits that reflect our identity, and contribute to positive outcomes for ourselves and others (Niemiec & Pearce, 2021). It is hypothesized that character strengths have a variety of functions, including reappraisal of past experiences and building resilience (Niemiec, 2020). Other important topics in positive psychology are resilience (Luthar et al., 2014), positive emotions (Fredrickson et al., 2003), gratitude (Davis et al., 2015), building positive relations through practicing kindness (Curry et al., 2018), cultivating hope (Cheavens & Ritschel, 2014), and practicing self-compassion (Neff et al., 2007). Central in the BAMBOO program is the discovery, exploration, and

application of character strengths (Niemiec, 2017), which is practiced with the participants in each session, by using a character strengths card-set (see Figs. 3, 4, 5, 6 in Appendix B). Furthermore, the program features a range of positive psychology topics and activities. For example, session one focuses on resilience. In an introductory exercise, participants talk about the origin of their first name and the meaning and/or positive connotations their names have. This exercise aims to build a positive self-identity, and familiarizes the participants with the topic of character strengths (Hendriks, 2021). Participants also engage in a positive arts intervention exercise, by expressing how they showed their resilience during their journey through a drawing (see Figs. 3, 4, 5, 6 in Appendix B). This exercise may stimulate the expressing of meaning, hope, and spirituality (Darewych & Riedel Bowers, 2018), while it also allows participants to express their negative emotions and experiences during the various phases of their flight, which may contribute to healing effects (Kalmanowitz & Ho, 2016; Rowe et al., 2017). After this exercise, participants reflect on character strengths they have used during their journey, which may function as a reappraisal of their past experiences and remind them of their resilience (Niemiec, 2020). Session two is focused on emotions. In this session, participants learn about the resiliency function of positive emotions (Tugade & Fredrickson, 2004), the importance of acceptance as a positive coping mechanism for refugees (Hinton et al., 2013), and explore how character strengths can be used to cope with negative emotions (Niemiec & Pearce, 2021). The topic of the third session is gratitude, which is practiced by positive reminiscence (Seligman et al., 2006). Furthermore, participants discover their signature strengths (Schutte & Malouff, 2019) and express gratitude towards themselves through a movement-based exercise, and express gratitude through prayer (Lambert et al., 2009). In session four, the exploration and application of character strength to cope with stress in daily life is practiced (Niemiec, 2019), and participants draw a group strength symbol (see Figs. 3, 4, 5, 6 Appendix B). This session is concluded by a guided meditation that focuses on building resilience through positive self-affirmations (Howell, 2017). Finally, in session five participants explore their priorities and quality of life, learn to set small positive goals and explore how they can apply their strengths to attain their goals (Quinlan et al., 2012). A guided meditation exercise and a short evaluation concludes the program. Furthermore, each session opens and closes with a ritual in which participants express positive self-affirmations, which may contribute to increased mental well-being (Epton et al., 2015) and learn movement-based relaxation techniques.

2.3 Cultural Adaptation of BAMBOO

Cultural adaptation refers to the systematic alteration of evidence-based interventions or protocols, to make them more compatible with the cultural norms, patterns, meanings, and values of intervention participants (Bernal & Domenech-Rodriguez, 2012). Interventions that have been adapted to the culture of its participants may be more effective than interventions that lack cultural sensitivity (Soto et al., 2019). Cultural sensitiveness can increase the credibility of an intervention among its participants,

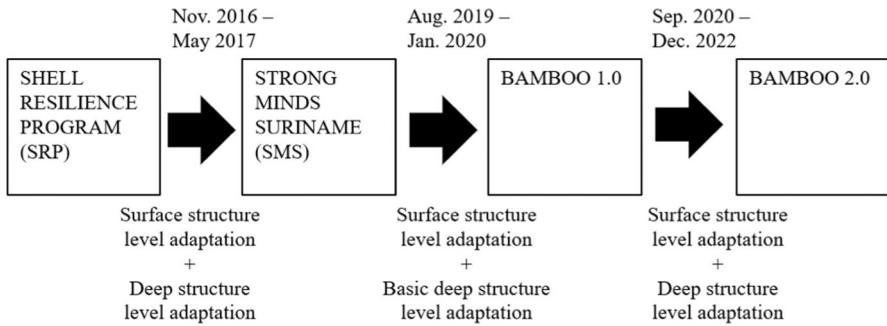


Fig. 1 Overview of the development of BAMBOO 2.0

and lead to increased engagement and commitment (Castro et al., 2004; Lau, 2006). A distinction can be made between surface structure level adaptation and deep structure level adaptation (Resnicow et al., 2000). Surface structure level adaptation entails adapting the content, semantic, conceptual, and technical equivalence of the program material (e.g., suitable activities, the program name, images and visual presentations in the program, and terminology used in training material). It is based on basic knowledge of the socio-cultural backgrounds of the participants for whom it is intended (Wang-Schweig et al., 2014). Deep structure level adaptation incorporates specific cultural values, norms, beliefs, and worldviews into an intervention. For example, it takes into account differences in the attitudes and communication styles between people from individualistic and collectivistic cultures (Triandis & Suh, 2002). The BAMBOO program was developed through time and built on the foundations of other programs that aimed to increase resilience (see Fig. 1).

The first version of BAMBOO was adapted from the Strong Minds Suriname program (SMS), a cultural sensitive positive psychology intervention (Hendriks, 2018) and was based on the Strong Minds Work program (Walburg, 2016), a program developed by Twente University, that in its turn was based on the Shell Resilience Program (SRP), an international resilience program for employees of oil company Shell (Lillington, 2012). Details of the adaptation process of the SMS program were described by Hendriks et al. (2019), who conducted a randomized controlled trial in Suriname, South America among 158 middle-to low educated employees with multi-ethnic backgrounds, including 41 Muslim participants. The study found large significant improvements on resilience, mental well-being, and negative affect, moderate improvements on depression and positive affect, and small improvements on anxiety (Hendriks et al., 2019). In 2019, the creators of the SMS program were approached by GZ healthcare to adapt the program, so it would be suitable for refugee populations. It is noteworthy to mention that one of the creators of the program has been working in the field of global mental health since the mid-eighties, with a focus on the mental healthcare of refugees across the world. In the period from August 2019 to January 2020 the BAMBOO program was developed (version 1.0), which included mostly surface level adaptations and some basic deep level adaptations (see Table 1). A feasibility study among 243 participants using a pretest–posttest (O1–X–O2) design,

Table 1 Overview of cultural adaptations of the BAMBOO program, versions 1.0 and 2.0

<p>Surface structure level adaptations BAMBOO 1.0</p> <ul style="list-style-type: none"> • Using a suitable program name and checking the appropriateness of the name with potential users • Selecting five theme names relevant for the refugee population, through focus group meetings with healthcare workers and interviews with key representatives • Developing non-stigmatizing promotion materials • Adding an exercise to identify emotions through the use of emoticons • Simplifying the exploration of character strengths through a drawing a cultural symbol instead of a making a word cloud • Developing workbooks for participants in multiple languages (Dutch, English, French, Arabic, Farsi, and Tigrinya) <p>Adapting psychoeducation to the context of refugees at reception centers</p> <p>Deep structure level adaptations BAMBOO 1.0</p> <ul style="list-style-type: none"> • Adding a walking exercise to internalize character strengths • Adding exploring character strengths through proverbs that are used in countries of origin • Adding a physical relaxation exercise • Discovering character strengths by using a card set with a symbol and character strengths names in multiple and including four additional culturally appropriate strengths • Adding an opening and closing ritual practicing positive self-affirmations and a gesture • Developing a training manual for the coaches 	<p>Surface structure level adaptations BAMBOO 2.0</p> <ul style="list-style-type: none"> • Adapting the positive affirmations in the opening and closing ritual • Including exercises using local proverbs and poems • Adapting the workbook: minimizing text and using more symbols, developing multi language workbooks (Dutch, English, Arabic, Farsi, Tigrinya and Turkish) • Simplifying psychoeducation, adapting psychoeducation to the context of refugees at reception centers and in municipalities <p>Deep structure level adaptations BAMBOO 2.0</p> <ul style="list-style-type: none"> • Removing exercises that were not received well by participants due to their complexity • Including a strengths-based activity in each session • Creating a session sequence that reflects the journey from the past to the future. Session one and two focus on applying strengths in the past, session three and four on applying strengths in the present, and session five focuses on applying strengths in the future • Shifting from activities related to emotional focused coping in sessions one, two, and three to problem-focused coping in sessions four and five, restructuring the sequence of the sessions • Including a movement-based relaxation exercise in each session • Including a meditational exercise in sessions three, four and five • More narrative exercises; substitution of several writing exercise for group discussion • Providing instructions for the deployment of the program outside asylum centers (municipalities) and instructions for an assistant trainer (e.g., AZC residents, experience experts) to increase scalability and cultural sensitivity
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reported a moderate to large increase in resilience, a large increase in happiness, a small increase in positive affect, and a moderate decrease in negative affect (Hendriks et al., 2023b).

After implementation of the program a mixed-method study was conducted over the period September 2020 to February 2022. During this period, data were collected during 44 BAMBOO programs were conducted across the Netherlands, in which 335 refugees participated. Quantitative data were collected from 50 trainers

and 30 participants, using online evaluation forms for the trainers, and paper and pencil evaluations for the participants. Qualitative data were collected through 50 semi-structured evaluation interviews with the trainers after conducting the five sessions. In addition, interviews were conducted with 30 participants on their experiences and levels of satisfaction with the program.

In addition, 24 in-depth interviews with refugees were conducted to investigate what character strengths were most frequently used to cope with daily challenges. Analysis of the data yielded the following points for improvement: i) more focus on the discovery, exploration and application of character strengths; ii) more focus on narrative expression (group-based discussions), less cognitive reflection (writing exercises); iii) more positive affirmation exercises; iv) more relaxation and movement-based exercises in each session; v) focus on emotional focused coping for activities dealing with daily challenges at an AZC, and a focus on problem-focused coping for activities dealing with (expected) daily challenges outside the context of an AZC; shorter and more practical psychoeducation on main topics; vi) a shorter workbook; vii) more visual aids and promotion material in the program such as worksheets with depictions of emotions and character strengths. We then adapted the program according to the principles of cultural-sensitive cognitive behavioral therapy (CS-CBT), a form of cognitive behavioral therapy that was developed to increase the cultural sensitivity of traditional CBT interventions for the treatment of traumatized refugees and ethnic minority populations (Hinton & Patel, 2018). Hinton and Patel have outlined nine key dimensions and 25 subdimensions for cultural adaptation, that can also be applied to the adaptation of positive psychology interventions. In the BAMBOO program, we integrated various key/sub dimensions of CS-CBT. The program includes activities that allow for the disclosure of religious and cultural participant characteristics, it addresses key stressors and trauma, it aims to lower stigmatization through psychoeducation on topics such as resilience and gratitude, it utilizes culturally appropriate metaphors and proverbs, and taps into local sources of resilience and recovery (e.g., prayer and meditation). In addition, we aimed to maximize credibility or the program by addressing the problems of most concern and building positive expectancy. A detailed description of all program sections can be found in Appendix A.

3 Methods

3.1 Study Design

We will conduct a single-blinded parallel randomized controlled trial (RCT), with an intervention group and a waiting list control group. The allocation ratio will be 1:1.

3.2 Participants

Inclusion criteria for participants are: 1) 18 years and older; 2) Arabic speaking; 3) permanently residing at AZC or municipality in the Netherlands; and 4) having attained a temporary residence permit (status holder). Exclusion criteria: currently

in treatment for severe psychological or psychiatric problems (as determined by a GZA mental healthcare specialist).

3.3 Procedure

The main researcher will start screening of potential candidates in April 2022, on the basis of information provided by the COA and available data on the current refugee population at AZCs in the Netherlands. After screening for inclusion and exclusion criteria, eligible participants will be recruited through a personal letter and are invited to a meeting, where they will receive information, after which where they can register for the trial. When sufficient candidates are recruited, participants will engage in the pre-test measures of the dependent variable (T0). At the beginning of the assessment the participants again receive an information letter and can sign an informed consent letter. Consecutively, they will be randomly assigned to the intervention group or a waiting list control group, using the online program research randomizer (<https://www.randomizer.org>). All analyses will be stratified by gender. The investigators in the trial will be blinded: a personal code for each participant will be created. The investigator who will allocate the participants and who analyzes the data can only identify participants by this code and not by the participants' names. All randomized participants will receive an information letter in a sealed opaque envelope, containing their given group number, training dates, and location. At the end of the fifth session, post-test measures will be conducted (T1). We opt for a follow-up assessment (T2) after 5 weeks, due to the limited time period that asylum seekers stay at an AZC, once they obtain a residence permit. A power analysis will be conducted with the software program G*Power (version 3.1.9.4), with an expected effect size $f=0.385$ (based on the effects size of the SMS program on resilience, see Hendriks et al., 2019), and a power of 0.8. This analysis suggested a total sample size of 56 participants. Taking into account a drop-rate of 20%, we aim to recruit 68 participants. Interventions are delivered by professionally trained healthcare providers of GZA, who already have experience in conducting the first version of BAMBOO and who will receive further training how to deliver the updated version that is tested in this trial. Figure 2 shows a flowchart of the study design. A complete schedule of enrolment, intervention and assessment is shown in Table 2.

3.4 Intervention

The BAMBOO program consists of five weekly 2-h sessions. Each session has a core topic, namely: (1) resilience; (2) emotions; (3) gratitude; (4) strengths; and (5) goal setting. The program contains a total of 39 different group-based and individual activities. Examples of group-based exercises are the opening and closing rituals, where participants stand in a circle and express positive affirmations and gratitude, and practice movement-based relaxation exercises. Examples of individual exercises are emotional disclosure through writing and drawing and discovering character strengths. Each session contains brief psychoeducation on the core topic, followed by positive psychology-based activities related to that topic. These include expressing resilience through drawing, discovering, exploring, and

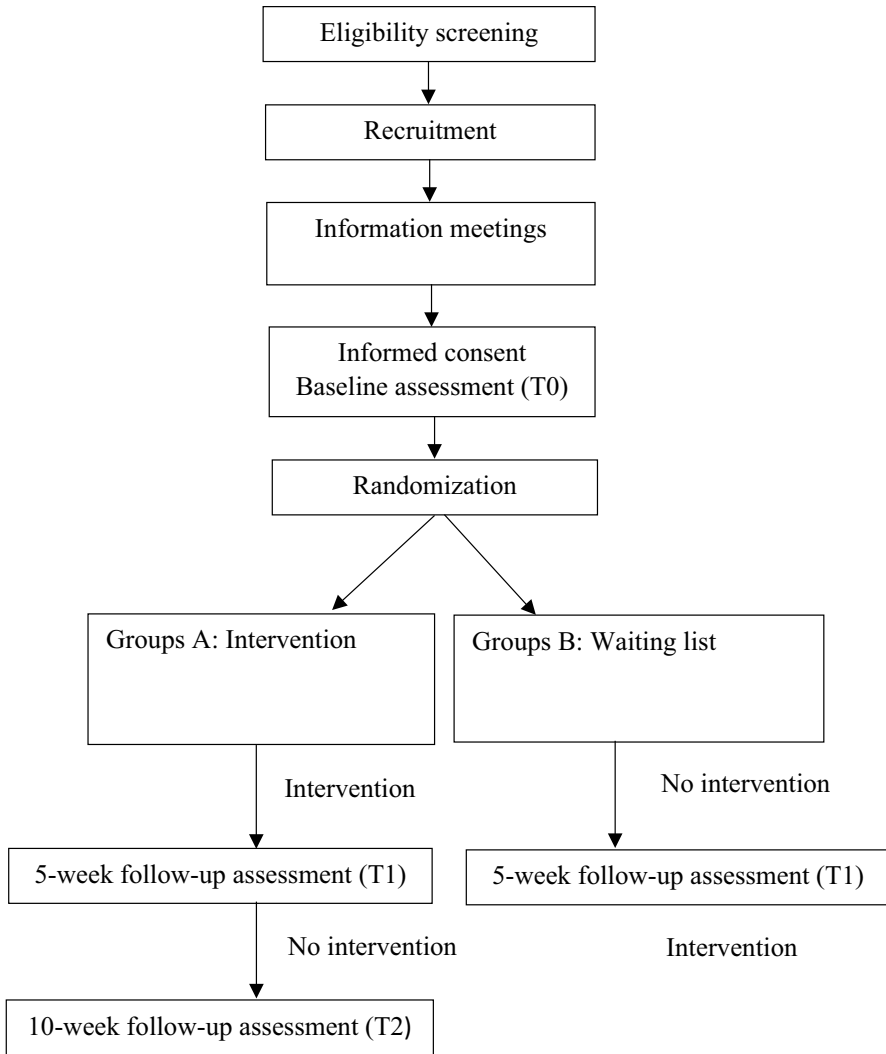


Fig. 2 Flowchart

applying character strengths, exercises in coping with negative emotions, various gratitude-based exercises, and setting positive goals. Attention is paid to religion and spirituality by including exercises in expressing gratitude through prayer and asking for resilience from a higher power. Table 2 provides an overview of the sessions and their main objectives, and a complete overview of activities during the sessions can be found in Appendix B.

The BAMBOO program is conducted by GZA healthcare professionals, who are assisted by one Arabic translator per group. We will preferably collaborate with translators who already have provided translations of BAMBOO program sessions during the period January 2020—September 2022. Before the start of each session, the translators will be instructed, and they will also be shortly debriefed at the end of each

Table 2 Overview of session objectives

<i>Objectives</i>	<i>Session</i>				
	1	2	3	4	5
Emotional disclosure of daily hassles and trauma	■				
Non-verbal expression of past (traumatic) experiences, current thoughts, and feelings, and (positive) future expectations	■				
Reflection on resilience		■			
Learning the functions of emotions and recognition of emotions		■			
Recognizing emotions			■		
Coping with negative emotions			■		
Destigmatizing psychological problems	■	■			
Expressing gratitude	■	■	■	■	■
Discovering, exploring, applying character strengths	■	■	■	■	■
Reflecting on the level of personal satisfaction with life	■	■	■	■	■
Learning about and setting positive future goals	■	■	■	■	■
Practising prayer and meditation	■	■	■	■	■
Building safety and trust	■	■	■	■	■
Increasing credibility and positive expectancy	■	■	■	■	■
Physical emotion regulation and relaxation	■	■	■	■	■
Building positive self- and group identity	■	■	■	■	■
Increasing positive emotions	■	■	■	■	■
Building positive relations	■	■	■	■	■

session. Currently, we are exploring the feasibility of deployment of refugees who participated in the program as assistant-trainers or ambassadors of the BAMBOO program.

4 Measures

4.1 Demographic Data

The following demographic data from the participants are gathered: age, gender, country of origin, religion, and residence status. In addition, participants are requested to indicate if they have received any psychological help during the past month.

4.2 Primary Outcome

Resilience The Connor Davidson Resilience Scale (CD-RISC-10) will be used to assess resilience. The scale consists of 10 items. 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. The original version of the CD-RISC consists of 25 items (Connor & Davidson, 2003), however, in this study the approved abbreviated Arabic version will be used

(Davidson, 2018). The CD-RISC has been used in various studies among refugee populations (Alqudah, 2013; Ameen & Cinkara, 2018; Pak et al., 2022).

4.3 Secondary Outcomes

Satisfaction with Life The Satisfaction with Life Scale (SWLS) will be used to measure global life satisfaction (Diener et al., 1985). The SWLS consist of five items, with score ranging 1 (strongly disagree) to 7 (strongly agree), with a higher score indicating a higher level of satisfaction. The scale was translated from English to Arabic by an official translation company. The scale has been used to in several studies among refugees from Syria, Iran, and Turkey (Sleijpen et al., 2016; Te Lindert et al., 2008; Yıldırım et al., 2022).

Positive and Negative Affect The International Positive And Negative Affect Schedule (IPANAS) will be used to measures positive and negative feelings (Watson & Tellegen, 1988). The scale includes ten items; five items measuring positive affect and five items measuring negative affect. Items are rated on a 5-point scale from 1 (little, or not at all) to 5 (very much), with a higher score reflecting a higher subjective experience of either positive or negative emotions. The PANAS has been used worldwide, among a wide variety of populations, including refugees from Afghanistan (Jibeen, 2019) and Palestine (Veronese & Pepe, 2020).

Self-esteem The Brief Rosenberg's Self-esteem Scale (B-RSES) (Monteiro et al., 2022) will be used to measure the level of self-esteem. It consists of ten items scored on a 4-point scale from 1 (strongly agree) to (strongly disagree), with a higher score indicating a higher level of self-esteem. The RSES has been frequently used to measure self-esteem among migrants and refugees (Ceylan et al., 2017; Gifford et al., 2007; Yetim, 2022).

4.4 Service-Level Measures

We will evaluate the following service-level outcomes through routine monitoring:

Participant retention and engagement. Attendance by the participants and their engagement during each session will be assessed by the trainers, using routine session monitoring forms. Debriefing will take place after each session, using semi-structured interviews with the trainers and the interpreters.

Fidelity. Fidelity to the protocol will be assessed using adherence monitoring checklists (i.e., checklist per session with required activities). Any deviations to the protocol will be registered by the trainers.

Usability. Trainers will complete the 10-item Intervention Usability Scale (Lyon et al., 2021) after each session to assess the perceived effectiveness, efficiency, and satisfaction of the participants.

4.5 Statistical Analyses

The intervention's efficacy will be assessed with analysis of covariance (ANCOVA) for each of the outcome variables. These analyses will include covaried pretest scores (T0) and compare the intervention group's posttest scores (T1) to those of the control group. 95% CIs are calculated for the mean difference (M_D) between groups using bias-corrected and accelerated (BCa) bootstrapping (2500 samples). All cases of item or unit level missing data from the included participants will be imputed using the Expectation–Maximization (EM) algorithm (Dempster et al., 1977). Using *t*-statistics, Cohen's d_s statistics are calculated (Lakens, 2013). Because only two groups are being compared, $t^2 = F$.

To assess how well the effects in the intervention group are maintained, paired-sample *t*-tests are conducted comparing that group's posttest (T1) to their follow-up scores (T2). All analyses are conducted using IBM® SPSS® Statistics (version 29). All instances of significance testing are two-tailed— $\alpha = 0.05$.

4.6 Data Management

All data will be coded (de-identified) and stored on a secure server hosted by GZA healthcare which is only accessible to the main researcher and a manager at GZA healthcare.

4.7 Ethical Considerations

This study involves human participants and will be performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Informed consent was obtained from all participants. The trial was approved by the Ethics Review Board of Tilburg University (TSB RP623).

4.8 Informed Consent

Written informed consent for participation in the study will be obtained from all participants before the baseline assessment. Participants will be informed that they can discontinue the program at any time, without any negative consequences. Active participation in all exercises during the program is also voluntary.

4.9 Confidentiality

The program sessions will be conducted in groups. To minimize the risk of breaching confidentiality, the BAMBOO trainers will stress the importance of not sharing information about other participants with people who are not part of the group in each session. Participants will also be instructed not to talk to others about the content and the reactions of other participants during the sessions. To preserve confidentiality, data collection forms contain a minimal amount of required identifiable information, and participant data will be pseudonymized.

4.10 Potential Harms

Data collection during the trial may be associated with mild emotional discomfort due to the discussion of sensitive topics. Adverse effects are not expected. The coaches who conduct the program are trained to identify acute signs of distress.

4.10.1 Premature Termination of the Study

The study could be terminated if COA decides that the program can no longer be conducted due to unforeseen circumstances. This could be the case, for example, if there is an outbreak of corona or other viruses, which could lead to a lockdown. In such a case, the intervention will stop and, most likely, restarted when the restrictive measures are lifted. In case of premature termination, participants will be notified by mail or in person.

4.11 Protocol Amendment

Any future substantial amendments will be reported to the Ethics Review Board of Tilburg University (ERB TiU).

5 Results

5.1 Dissemination

All results of the trial will be reported in the relevant scientific journals (open access) and at international conferences. Trial results will also be included in the final project evaluation report for ZonMW, and a summary of the results will be published on the website of ZonMW and GZA healthcare.

6 Discussion

There is a growing need for low-cost, scalable, and culturally sensitive preventive intervention programs to strengthen resilience and increase mental well-being among refugee populations. The present study aims to examine the short- and mid-long-term effects of a strengths-based intervention, based on theoretical framework of positive psychology, called BAMBOO. The trial will test if the positive outcomes of the program that were found in a pretest–posttest study of the first version of BAMBOO, can also be found in the revised version, when tested under randomized controlled conditions. The study may provide a foundation for future studies on the efficacy of positive psychology interventions among refugee populations and contribute to the disentanglement of mechanisms that explain how prevention programs improve well-being among refugees.

Appendix A Detailed information on the content of the BAMBOO program 2.0

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		Session 1: Resilience				
Section	Activities	Main objectives	Form	Theoretical framework	References	
1a	Opening Participants are welcomed, receive information about the program set-up and goals, and discuss house rules.	Building safety and trust, increasing credibility and positive expectancy.	Group-based	Cultural sensitive-CBT	(Colijn, 2010; Hinton, 2017; Kirmayer et al., 2012; Kirmayer et al., 2011)	
1b	Name and fame Participants share first names and the character strengths associated with them.	Building positive self-and group identity.	Group-based	Positive Psychology	(Hendriks, 2021; Norzon & Nesom, 2005)	
1c	How are you doing? Participants tell how they are currently doing.	Emotional disclosure of daily hassles and trauma.	Group-based	Positive CBT and Trauma-focused CBT	(Bannink, 2017; Kirmayer, 2003; Kirmayer et al., 2011; Slavinspenny et al., 2011)	
1d	My resilient road Participants make a drawing of their journey to the Netherlands and the road ahead.	Non-verbal expression of past (traumatic) experiences, current thoughts and feelings, and (positive) future expectations.	Individual	Cultural sensitive-CBT Positive Arts.	(Darewych & Riedel Bowers, 2018; Hinton, 2017)	
1e	I am resilient Participants discover character strengths used during their journey through a card game.	Discovering and exploring character strengths, reflection on resilience.	Group-based	Positive Psychology	(Hendriks et al., 2018; Niemiec & Pearce, 2021; Seligman et al., 2006)	

Appendix A (Continued)

1f	BAMBOO ritual 1	Participants express gratitude, positive self-affirmations, and practice movement-based relaxation techniques.	Building positive self- and group identity, relaxation, increasing pleasant (positive) emotions	Group-based	Positive Psychology Cultural sensitive-CBT	(Epton et al., 2015; Fredrickson, 2001; Hinton & Kirmayer, 2016; Schmalzl et al., 2014)
Session 2: Emotions						
2a	Opening	Activities Participants are welcomed and receive information on the session goals.	Objectives Building safety and trust, increasing credibility and positive expectancy.	Form Group-based	Theoretical framework Cultural sensitive-CBT	References (Colijn, 2010; Hinton, 2017; Kirmayer et al., 2012; Kirmayer et al., 2011)
2b	BAMBOO ritual 2	Participants express positive self-affirmation and learn movement-based relaxation techniques.	Building positive self- and group identity, relaxation, increasing pleasant (positive) emotions.	Group-based	Positive Psychology Cultural sensitive-CBT	Epton et al., 2015; Hinton & 2001; Hinton & Kirmayer, 2016; Schmalzl et al., 2014)
2c	The four basic emotions	Participants receive psychoeducation on emotions.	Learning the functions of emotions, destigmatizing psychological problems.	Group-based	Positive Psychology	(Bannink & Jackson, 2011; Fredrickson, 2001; Tracy & Randles, 2011),
2d	Positive or negative	Participants learn to recognize different emotions and engage in a group discussion about emotions.	Recognizing emotions, destigmatizing psychological problems.	Group-based		
2e	The guest house	Participants discuss acceptance as a coping strategy on the basis of poem by Rumi.	Coping with unpleasant (negative) emotions, destigmatizing psychological problems.	Group-based	Cultural sensitive-CBT	(Hinton, 2017; Rumi, 2008)

Appendix A (Continued)

2f	Write it down	Participants write down or draw three unpleasant (negative) emotions.	Coping with unpleasant (negative) emotions.	Individual	Writing therapy	(Pennebaker & Beall, 1986; Pennebaker & Chung, 2011; Travagin et al., 2015)
2g	A step in the right direction	Participants explore how they can apply character strengths to cope with unpleasant (negative) emotions.	Coping with unpleasant (negative) emotions, increasing bodily awareness	Group-based	Positive Psychology	
2h	Closing: BAMBOO ritual 2	Participants express gratitude, positive self-affirmations, and practice movement-based relaxation techniques.	Building positive self-and group identity, relaxation, increasing pleasant (positive) emotions.	Group-based	Positive Psychology Cultural sensitive-CBT	(Epton et al., 2015; Fredrickson, 2001; Hinton & Kirmayer, 2016; Schmalzl et al., 2014)
Session 3: Gratitude						
3a	Section Opening	Activities Participants are welcomed, receive information on the session goals.	Objectives Building safety and trust, increasing credibility and positive expectancy.	Form Group-based	Theoretical framework Cultural sensitive-CBT	References (Colijn, 2010; Hinton, 2017; Kirmayer et al., 2012; Kirmayer et al., 2011)
3b	BAMBOO ritual 3	Participants express positive self-affirmation and learn movement-based relaxation techniques.	Building positive self-and group identity, relaxation, and increasing pleasant (positive) emotions.	Group-based	Positive Psychology Cultural sensitive-CBT	(Epton et al., 2015; Fredrickson, 2001; Hinton & Kirmayer, 2016; Schmalzl et al., 2014)
3b	Better one bird in your hand...	Participants discuss proverbs that express gratitude and receive psychoeducation on gratitude.	Increasing pleasant (positive) emotions.	Group-based	Positive Psychology/ Cultural sensitive-CBT	(Bohlmeijer, 2021; Cregg & Cheavens, 2021; Davis et al., 2015; Hinton et al., 2012)

Appendix A (Continued)

3c	Three good things	Participants write down three things for which they are grateful; discuss their gratitude and receive information on writing a gratitude journal	Increasing pleasant (positive) emotions.	Individual & Group-based	Positive Psychology	(Emmons & Stern, 2013; Seligman et al., 2006)
3d	Be grateful for your strengths	Participants discover their signature strengths.	Building positive self-identity.	Individual	Positive Psychology	(Peterson & Seligman, 2004; Schutte & Malouff, 2019)
3e	Five star walk	Participants affirm their signature strengths in conjunction with movement and express their gratitude.	Discovering and exploring character strengths, increasing pleasant (positive) emotions.	Group-based	Positive Psychology	(Schutte & Malouff, 2019; Veenstra et al., 2017)
3f	Gratitude prayer	Participants express their gratitude in a (silent) prayer and engage in silent meditation.	Increasing pleasant (positive) emotions, increasing bodily awareness, relaxation.	Individual & Group-based	Positive Psychology	(Masters & Spielmanns, 2007; Passmore & Oades, 2022)
3g	Closing: BAMBOO ritual 3	Participants express gratitude, positive self-affirmations, and practice movement-based relaxation techniques.	Building positive self-and group identity, relaxation, increasing pleasant (positive) emotions.	Group-based	Positive Psychology Cultural sensitive-CBT	(Epton et al., 2015; Fredrickson, 2001; Hinton & Kirmayer, 2016; Schmalzl et al., 2014)
	Section	Activities	Objectives	Form	Theoretical framework	References
			Session 4: Strengths			

Appendix A (Continued)

4a	Opening	Participants are welcomed, receive information on the session goals.	Building safety and trust, increasing credibility and positive expectancy.	Group-based	Cultural sensitive-CBT	(Colijn, 2010; Hinton, 2017; Kirmayer et al., 2012; Kirmayer et al., 2011)
4b	BAMBOO ritual 4	Participants express positive self-affirmation and learn movement-based relaxation techniques.	Building positive self- and group identity, relaxation, increasing pleasant (positive) emotions.	Group-based	Positive Psychology Cultural sensitive-CBT	(Epton et al., 2015; Fredrickson, 2001; Hinton & Kirmayer, 2016; Schmalzl et al., 2014)
4c	Stress in your daily life	Participants talk about the stressors in their daily lives and how they cope with them.	Emotional disclosure of daily hassles and trauma.	Group-based	Cultural sensitive-CBT	(Hinton, 2014; Kirmayer et al., 2011; Slavish-Spenny et al., 2011)
4d	Strengths in your daily life	Participants explore character strengths that can help to cope with their daily challenges.	Discovering, exploring, and applying character strengths.	Individual	Positive Psychology	(Darewych & Riedel Bowers, 2018; Hendriks et al., 2023a; Niemiec, 2012; Niemiec, 2017; Seligman et al., 2006)
4e	Strength symbol	In small groups, participants make a drawing that contains and symbolizes their character strengths.		Group-based		
4f	Behind my back	Participants engage in a roleplay where they talk about each other strengths.		Group-based		
4g	Awaken your strengths	Participants engage in a guided meditation to develop inner strengths.	Exploring character strengths, practicing prayer and cultural sensitive meditation.	Group-based	Positive Psychology, Cultural sensitive CBT	(Hendriks et al., 2021a; Hinton & Jalal, 2014; Schneider et al., 2010)

Appendix A (Continued)

4h	Closing: BAMBOO ritual 4	Participants express gratitude, positive self-affirmations and practice movement-based relaxation techniques.	Building positive self- and group identity, relaxation, increasing pleasant (positive) emotions.	Group-based	Positive Psychology Cultural sensitive-CBT	(Epton et al., 2015; Fredrickson, 2001; Hinton & Kirmayer, 2016; Schmalzl et al., 2014)
Session 5: Goals						
5a	Sections Opening	Activities Participants are welcomed, receive information on the session goals.	Objectives Building safety and trust, increasing credibility and positive expectancy.	Form Group-based	Theoretical framework Cultural sensitive-CBT	References (Colijn, 2010; Hinton, 2017; Kirmayer et al., 2012; Kirmayer et al., 2011)
5b	BAMBOO ritual 5	Participants express positive self-affirmation and learn movement-based relaxation techniques.	Building positive self- and group identity, relaxation, increasing pleasant (positive) emotions.	Group-based	Positive Psychology Cultural sensitive-CBT	(Epton et al., 2015; Fredrickson, 2001; Hinton & Kirmayer, 2016; Schmalzl et al., 2014)
5c	Wheel of life	Participants discover and discuss how satisfied they are on various domains in life.	Reflecting on the level of personal satisfaction with life.	Individual Group-based	Positive Psychology	(Eakman, 2016)
5d	Small goal setting	Participants receive psychoeducation on setting small and attainable goals.	Learning about positive goal setting.	Group-based	Positive Psychology	(Bannink, 2015)
5e	Your positive goals	Participants set positive future goals.	Setting positive future goals.	Individual	Positive Psychology	(Bohlmeijer & Hulsbergen, 2013)

Appendix A (Continued)

5f	Strengths and goals	Participants select character strengths that they can use to achieve their goals, and discuss this in small groups	Applying character strengths to attain pleasant (positive) goals.	Group-based	Positive Psychology	(Linley, 2010; Niemiec, 2017)
5g	Awaken your strengths and surrender	Participants engage in a guided meditation that focuses on positive goal setting and surrendering desires to a higher power.	Exploring character strengths, practicing prayer and cultural sensitive meditation.	Group-based	Positive Psychology, Cultural sensitive CBT,	(Helminski, 2017; Hendriks et al., 2021b; Hinton & Jalal, 2014)
5h	Evaluation and certificate	In a group discussion, participants evaluate the program and receive a certificate of participation, enjoy self-made food.		Group-based		
5i	BAMBOO ritual 5	Participants express gratitude, positive self-affirmations and practice movement-based relaxation techniques.	Building positive self-and group identity, relaxation, increasing pleasant (positive) emotions.	Group-based	Positive Psychology Cultural sensitive-CBT	(Epton et al., 2015; Fredrickson, 2001; Hinton & Kirmayer, 2016; Schmalzl et al., 2014)

Appendix B BAMBOO training material and examples of output by participants



Fig. 3 Training material: BAMBOO Character Strengths cards used in each session. * in addition to the 24 character strengths according to the VIA Classification of Character Strengths and Virtues we added four strengths that may be relevant for refugee populations, namely acceptance, adaptability, harmony, and patience

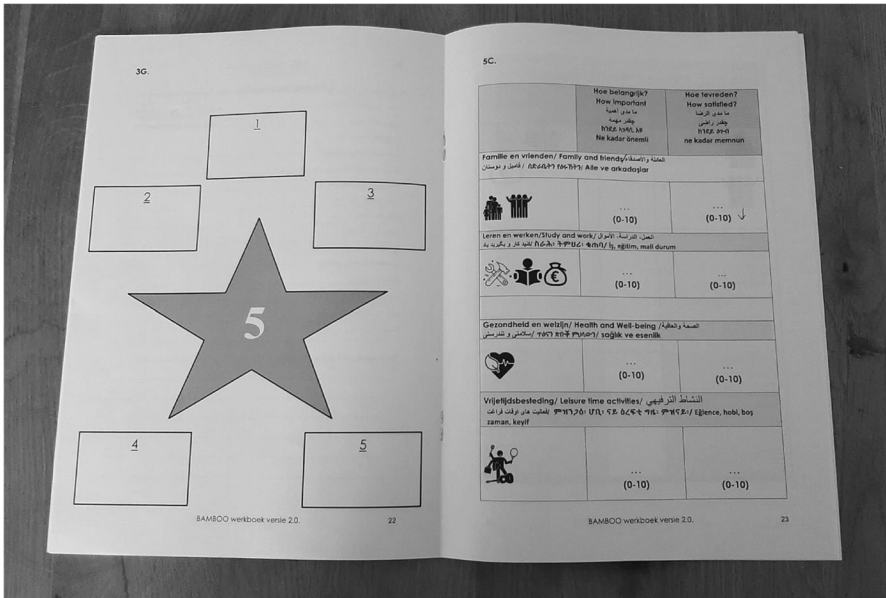


Fig. 4 Training material: Workbook for participants (in Dutch, English, Arabic, Farsi, Tigrinya, and Turkish)

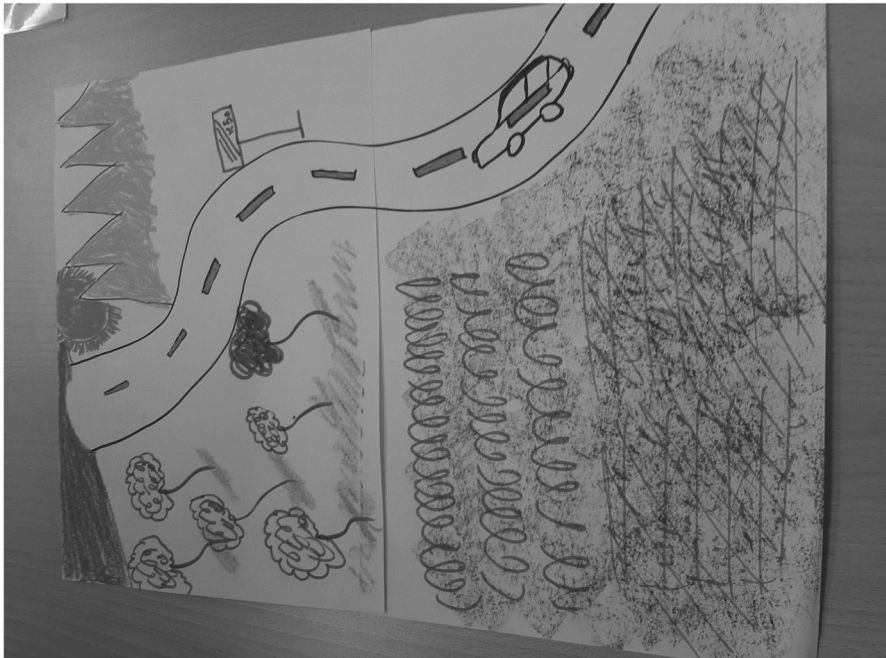


Fig. 5 Example ‘Your Resilient Road’ drawing from session one. Note: the original drawing is in color. The right side underneath the road represents the past and contains a blood-red colored field with no vegetation. The middle field, which represents the current situation, is green-colored and contains low-growing grass. On the left side, which represents the future, flowering trees in green and blue colored sea/lake are drawn and behind the mountains at the left top a yellow/orange sun is shining.

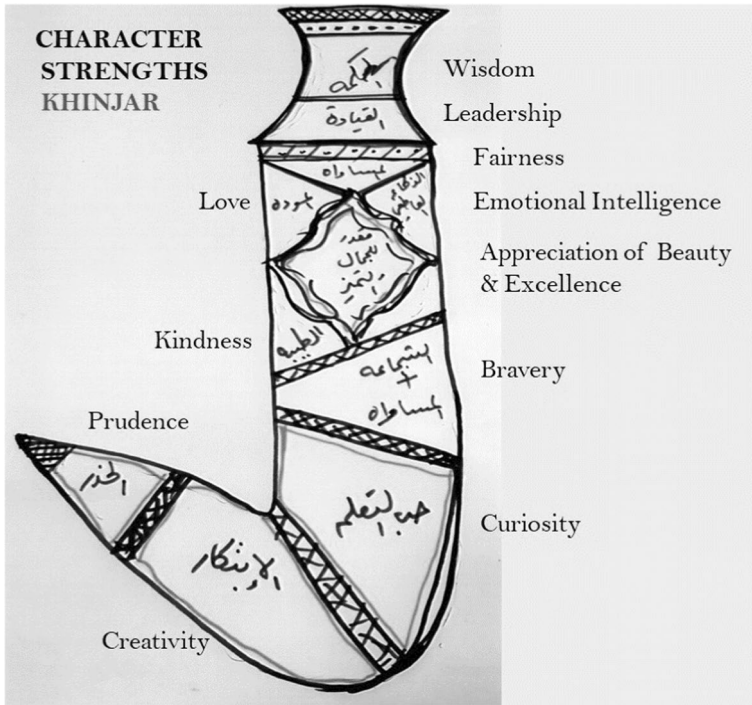


Fig. 6 Example of a character strengths symbol, drawn by a group of Syrian refugees, from session four. Note: we added the meaning of the Arabic words in English to the image.

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Declarations

Competing Interests The authors declare that they have no competing interests.

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