The *Inspired Life Program*: Development of a Multicomponent Positive Psychology Intervention for Rural Adults in Ghana

Richard Appiah[1,2*], Angelina Wilson Fadiji[1,3], Marié P. Wissing[1] and Lusilda Schutte[1]

[1]Africa Unit for Transdisciplinary Health Research, North-West University, Potchefstroom, South Africa

[2]College of Health Sciences, University of Ghana, Accra, Ghana

[3]Department of Educational Psychology, Faculty of Education, University of Pretoria, Pretoria, South Africa

* Correspondence:
Richard Appiah
riappiah@ug.edu.gh; richardappiah2010@gmail.com

Running title: Appiah et al.: The Inspired Life Program

Abstract

Although several theories and studies have explored human strengths and mental well-being at the global level, these insights are rarely tested and translated into practice in sub-Saharan Africa. This study aims to describe the development of a 10-session multicomponent positive psychology intervention, the *Inspired Life Program* (ILP), designed to promote mental health and reduce symptoms of depression and negative affect in rural adults in Ghana. Guided by the Medical Research Council's framework for developing complex interventions, a seven-step iterative community-based participatory research approach was adopted to develop the ILP, based on constructs and principles of positive psychology and cognitive-behavioral model. The final intervention components included a 10-session, two-hourly, once-weekly manualized program designed to promote meaningful and purposeful living, self-acceptance, personal growth, goal-setting and problem-solving skills, and positive thinking through group discussion and activity sessions. We describe the program theory and implementation strategy of the final intervention, and reflect on the challenges and lessons learned from applying this framework in the study context. The development of strengths-based interventions and practicality of methods to promote positive mental health in rural adults are feasible, and have important policy implications for mental health and social care in sub-Saharan Africa.

***Keywords*:** positive psychology intervention; community-based participatory research; development of complex interventions; inspired life program; rural poor adults; mental health; Ghana.

1 Background

The last decade has seen the pursuit of positive human functioning such as satisfaction with life, development of personal talents and capacities, and purposeful engagement in life rise in prominence in the international policy and research agendas (Ryff, 2017). These advances have led to a broader knowledge base of the theories and constructs supporting the promotion of positive mental health and human flourishing. Until recently, public mental health research has focused mostly on the prevention and treatment of mental illness and on evaluating standardized protocols and guidelines for the treatment of psychopathology (Clark, Cuthbert, Lewis-Fernández, Narrow, & Reed, 2017). However, presently, there is increasing awareness that complete mental health state encompasses both the absence of mental illness and the presence of positive mental health (Keyes, 2005; Keyes, 2007; WHO, 2018). Recent research has also underscored the importance of promoting positive mental health in addition to the traditional biomedical approach to preventing and treating mental illness in both clinical and non-clinical populations (Kobau et al., 2011; Schotanus-Dijkstra, Pieterse, Drossaert, Walburg, & Bohlmeijer, 2019). Over half a century ago, research pioneers drew on theoretical models and empirical studies of humanistic psychology to articulate frameworks for translating mental health research into applied efforts to promote positive human development (Sigelman & Rider, 2014). Amidst the compelling need for research-informed practice to advance mental health in various groups of people, there is a growing appreciation for the need to develop and evaluate interventions that support individuals, communities, and organisations to thrive (Hendriks et al., 2019).

Recent developments in positive psychology and public mental health have heightened the need to shift focus from risk-reduction and deficit-focused orientations (Haggerty & Mrazek, 1994) towards a competence enhancement model (Botvin & Griffin, 2015) that advances individuals'

psychological competences and optimal functioning. There is also a growing appreciation of a dual-systems model (i.e., second wave positive psychology) that recognizes the complex interactions between the positive and negative dimensions of life which are expressed in an individual's thinking patterns, feelings, and behavior under various circumstances (Lomas & Ivtzan, 2016; Wong, 2011).

While several studies exist that describe the development of behavior change and health promotion intervention programs, the majority of the programs were designed primarily for urban populations (e.g., Friedman et al., 2017), targeted clinical populations or practice (e.g., Connell, McMahon, Redfern, Watkins, & Eng, 2015; Murphy et al., 2017), and do not follow any specific framework or guideline in their development (e.g., Huffman, Mastromauro, Boehm, Seabrook, & Fricchione, 2011; Jaser, Patel, Linsky, Whittemore, 2014). Existing interventions that were developed and validated in Western contexts may be less effective in non-Western contexts, such as Africa, given the wide cultural disparities. A limited number of behavior change and health promotion interventions have been designed and evaluated in Africa, but these interventions do not provide detailed description of the development process (e.g., Bonthuys, Botha, Nienaber, Freeks, & Kruger, 2011; Rugira, Nienaber, & Wissing, 2015), utilize any specific framework (e.g., Van Zyl & Rothmann, 2012), or were primarily developed to enhance clinical practice (e.g., Chandler et al., 2014; English, 2013). Generally, there is a dearth of empirically-tested behavior change and health promotion interventions that advance positive mental health in the rural context of Ghana, where resources are limited and mental health interventions are stigmatized. The structure of the content and strategy of implementation of most interventions also require highly skilled professionals to implement, leading to high implementation costs. Although the majority of psychological interventions are individual-based, some studies have demonstrated the effectiveness of group community-based interventions in a variety of contexts (e.g., Appiah, Wilson-Fadiji, Schutte, & Wissing, 2020; Friedman et al., 2017). Group-based psychological interventions permit delivery of

sessions in a group format to several participants simultaneously. This approach is cost-effective, can encourage the development of peer support, social networks and collaborative therapeutic relationships, carries longer lasting effects (Chiumento et al., 2017), and may resonate well within a more collectivist cultural context, such as Ghana.

A number of empirically-evaluated frameworks and models exist that provide practical guidance for developing and evaluating the effectiveness of behavior change health promotion intervention programs for specific populations (see De Silva et al., 2014; Moore, Audrey, & Barker, 2015). The 6-Steps for Quality Intervention Development (6SQuID) framework (Wight, Wimbush, Jepson, & Doi, 2016), for instance, presents a pragmatic six-step guide for developing public health interventions. In applying the 6SQuID, researchers and practitioners need to (1) define and understand the problem and its causes; (2) identify the causal or contextual factors that can/should be modified to maximize the impact; (3) decide on the mechanisms of change; (4) clarify how the identified mechanisms of change will be implemented; (5) test and adapt the intervention; and (6) collect sufficient evidence to evaluate the developed intervention program.

Another framework, the Intervention Mapping framework (Bartholomew, Parcel, Kok, & Gottlieb, 2006), with its emphasis on the importance of integrating theory and evidence in program planning, also describes a six-step systematic process to guide the development and evaluation of health promotion intervention programs. The steps include: (1) needs assessment; (2) formulation of change objectives (i.e., intervention objectives and their determinants); (3) selection of theory-based methods and practical strategies; (4) intervention development; (5) development of adoption and implementation plan; and (6) evaluation planning. A widely used framework, the Medical Research Council framework for the development and evaluation of complex interventions (MRC; Craig et al., 2008; Craig, Dieppe, Macintyre, Michie, Nazareth, & Petticrew, 2013), was designed to guide researchers and practitioners to develop and evaluate public health intervention programs in various

contexts. The four-phase, non-sequential, flexible MRC framework, developed two decades ago, emphasizes the importance of theory and context in intervention design and comprises of (1) development of the complex intervention (i.e., the explication of evidence base, theory and modelling processes and outcomes); (2) feasibility and piloting (i.e., testing procedures, estimating and retention and determining sample size; (3) evaluation (i.e., assessing effectiveness, understanding change process, and assessing cost effectiveness); and (4) implementation (i.e., dissemination, surveillance, and monitoring).

To our knowledge, presently, there is paucity of research that systematically reports the development of strengths-based interventions in Ghana, and sub-Saharan Africa more generally, in a level of detail sufficient to permit their replication in other studies or for use in practice. Yet, mental health interventions are needed that conform to the culture of the people, are feasible and sustainable, and can be implemented by non-professionals in resource-limited contexts. Using a community-based participatory research (CBPR) approach, the research team collaborated with field experts and selected community members from the target population in the Sunyani West District to develop a novel, 10-session multicomponent positive psychology intervention (mPPI) program (the *Inspired Life Program*; ILP) – aimed at promoting positive mental health and reducing symptoms of depression and negative affect among rural poor adults in Ghana. The development process of the ILP was guided by the recommendations of the MRC's framework for developing and evaluating complex interventions, and was based on constructs and principles of positive psychology and cognitive-behavioral intervention. The ILP was subsequently evaluated in a quasi-randomized controlled trial to evaluate its effectiveness in promoting the mental health of a sample of rural poor adults in the middle belt of Ghana across two time points. The results suggest greater improvement in positive mental health, with a marked reduction in symptoms of depression and negative affect in the

intervention group, compared to the control group, immediately and three months after the intervention (see Appiah et al., 2020).

The overarching aim of this paper is to describe the development of a 10-session mPPI – the ILP – designed to promote positive mental health and reduce symptoms of depression and negative affect in rural adults in Ghana.

2 Methods

A seven-step systematic process was adopted to develop and pilot-test the novel group-based mPPI – the ILP, based on selected constructs and principles of positive psychology and cognitive-behavioral model. The first five steps (1–5) correspond to the "development" phase of the MRC's framework for developing and evaluating complex interventions (see Craig et al., 2013; Craig et al., 2008). Steps 6 and 7 correspond to the "feasibility/piloting" phase of the MRC's framework. We followed Borek Abraham, Smith, Greaves, and Tarrant's (2015) suggested guideline for the descriptions of group-based behavior change interventions to describe the design, content, participants, and the characteristics of the facilitators involved in the intervention. First, we provide a background of the population and study context, the intervention development team and process, and an overview of the intervention development process. This is followed by a detailed description of the objective, methods, and outcome of each step of the development process. Subsequently, we present an overview of the final intervention in line with Borek et al.'s (2015) reporting guidelines. A summary of the steps undertaken in the development of the ILP is presented in Figure 1.

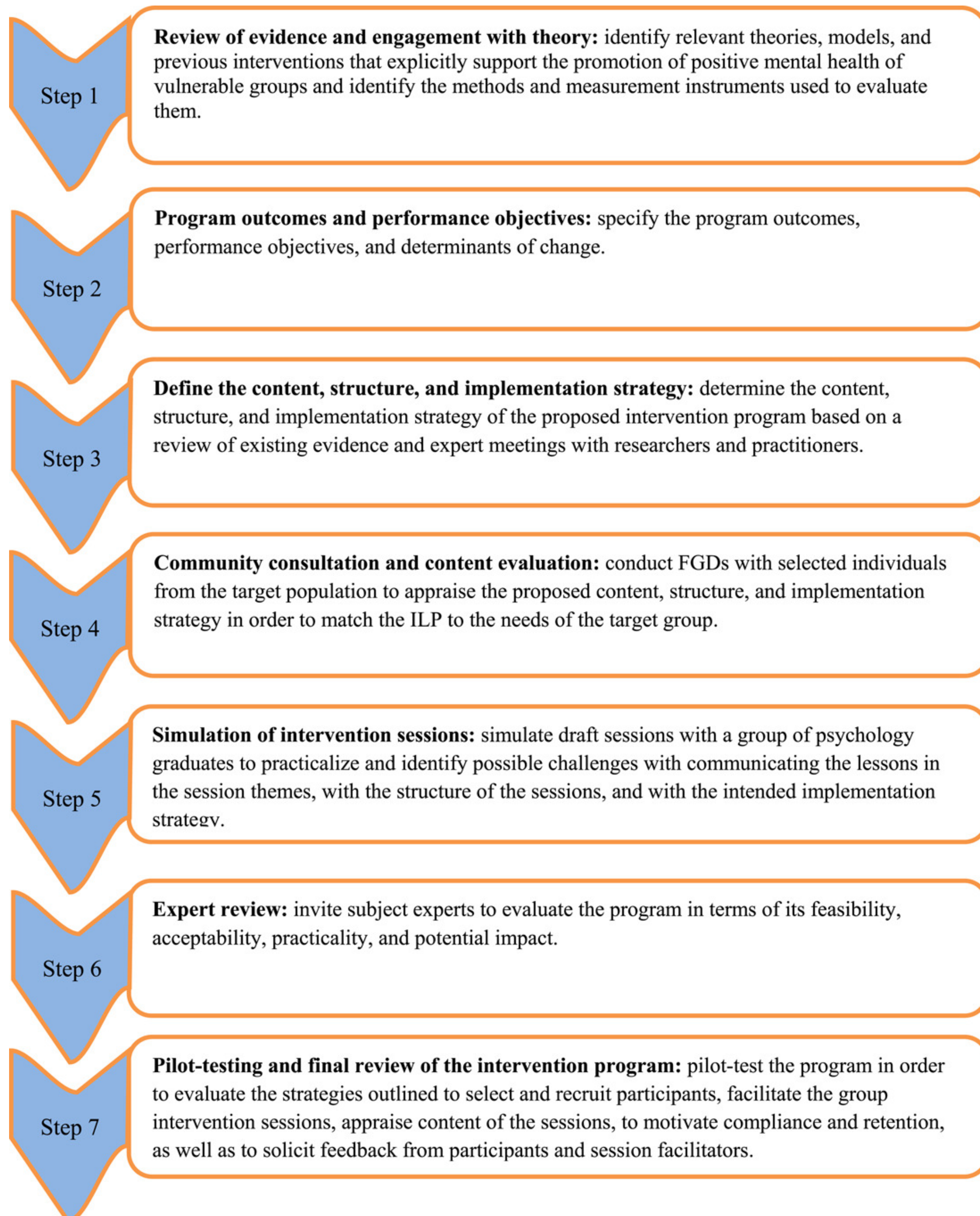

Figure 1. Flow diagram of the development process of the ILP intervention program. FGD, focus group discussion; ILP, Inspired Life Program

2.1 Population and Context

The ILP was formulated and pilot-tested with participants drawn from two rural poor communities located within the Sunyani West District of the Brong Ahafo region of Ghana. These communities, with an average of 150 households, were randomly selected from a pool of 18 similarly classified rural poor communities using a computer-generated number sequence created with Excel. Communities were categorized as poor with household income below 50% of the poverty line (US$1.90 a day), or ultra-poor (US$ 1.25 or less a day) (Ghana's District League Table, 2016; Ghana Statistical Service, Ghana Health Service, & Inner City Fund International, 2015). Residents are mainly peasant farmers and trade in farm produce, speak Twi, are more collectivistically oriented, and are governed by an elected chief and his elders. Residents typically share similar socioeconomic characteristics (Ghana Statistical Service et al., 2015). Communities are connected by poor road networks and footpaths and mostly have access to only public toilets and basic (primary) schools. Although there is electricity in most of these communities, only about half of the households are connected to the grid.

2.2 Intervention Development Team and Process

We established a team with considerable experience in positive psychology and cognitive-behavior interventions to ensure that we created an intervention that was grounded in evidence, yet well-adapted to and feasible for the target population. Three of the members of the research team are also experienced clinical psychology practitioners. After the first draft of the sessions was completed and community members consulted to appraise the proposed content, structure, and implementation strategy of the intervention sessions, eight graduate students (including bachelor psychology graduates and clinical psychology interns) were invited to simulate the sessions. Three independent psychologists with a vast knowledge of the theories underpinning the intervention

were invited as expert panelists to critically review the program. Two of the three panelists also have in-depth knowledge about the cultural values and customs of the target population.

The remit was to develop methods and materials, based on the MRC's framework, which could be delivered in a small group to promote positive mental health and reduce symptoms of depression and negative affect of rural adults in Ghana. Essentially, the program also seeks to build participants' resilience and increase their vocational productivity. The objective, methods, and outcome of each step of the development process are presented below.

2.2.1 Step 1: MRC development: Review of evidence and engagement with theory.

Objective and methods: The aim of this step was to identify relevant theories, models, and previous interventions that explicitly support the promotion of positive mental health (i.e., psychological well-being) and flourishing of vulnerable groups and to identify the methods and measurement instruments used to evaluate the identified interventions. Several systematic reviews suggest that specific theories, constructs, and principles drive the formulation of particular interventions (Bolier et al., 2013; Maini, Mounier-Jack & Borghi, 2018; Sin & Lyubomirsky, 2009; Weiss, Westerhof, & Bohlmeijer, 2016; White, Uttl, & Holder, 2019). A wealth of evidence exists to suggest that theory-based health interventions are more effective than health interventions formulated based on pragmatism only (see Chandler, Rycroft-Malone, Hawkes, & Noyes, 2016; Michie, Yardley, West, Patrick, & Greaves, 2017). Where possible, literature was sought that applied such interventions to rural poor adults and vulnerable populations in low-income countries. With eligibility criteria specified *a priori*, we searched online databases (i.e., Medline/PubMed, CINAHL, APAIS, PsychInfo, Web of Science, Google, and Google Scholar) and printed journals and books, using derivatives of mental health, positive psychology interventions, cognitive-behavioral interventions, development of interventions, community-based interventions, group-based participatory research, and health promotion.

Outcome. We identified four meta-analyses (Bolier et al., 2013; Sin & Lyubomirsky, 2009; Weiss et al., 2016; White et al., 2019) and three studies that applied both systematic review and meta-analysis methodologies (Chakhssi et al., 2018; Donaldson, Lee, & Donaldson, 2019; Hendriks et al., 2019) that evaluate the effectiveness of specific PPIs. The reviews and meta-analyses conclude, overall, that the interventions were effective in promoting mental health and reducing symptoms of psychopathology. Although the interventions reported in these reviews did not specifically focus on promoting mental health of rural poor adults, the majority (see Bolier et al., 2013; Weiss et al., 2016) were intended to promote mental health and well-being among general, often vulnerable samples. Previous empirical studies with Ghanaian samples that examined the indicators of psychological well-being among rural men and women (Arku, Filson, & Shute, 2008); predictors of subjective well-being (Addai, Opoku-Agyeman, & Amanfu, 2014); the meaning of well-being by examining the linkages between lay conceptions of well-being and measures of hedonic and eudaimonic well-being (Wilson Fadiji, Meiring, & Wissing, 2020); and the construction of the meaning of health and well-being (Glozah, 2015) provided valuable resources to understand how the population conceptualizes mental health.

Based on the study objectives, specific references were also made to selected constructs and principles of positive psychology that promote and protect mental health, including kindness (Curry et al., 2018), empathy (Hodges, Clark, & Myers, 2011), self-acceptance (Page & Vella-Brodrick, 2013; Ruini & Ryff, 2016), personal growth (Ruini & Ryff, 2016), meaning and purpose in life (Martela & Steger, 2016), and positive relationships with others (Proyer et al., 2015) to establish the foundation of the envisaged new well-being intervention program. There exists considerable empirical evidence that supports the practical operationalization of these constructs in promoting positive mental health (Damreihani et al., 2018; Ryff, 2014; Weiss et al., 2016). We also made references to a number of constructs and principles underlying Beck's cognitive-behavioral model

(Beck, 1991; Beck, 2011), as determined *a priori*. Cognitive-behavioral interventions have emerged as effective, flexible, and cost-effective interventions that can be easily adapted to fit many different contexts (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012; Lund et al., 2011). Several constructs and principles from the cognitive-behavioral model have been applied to build resilience and positive qualities and attributes that can be utilized to bounce back from psychological shocks (Bannink, 2014). Based on the outcomes of previous empirical research, we purposefully aimed to integrate selected principles from Beck's cognitive-behavioral model into the program to promote subjective well-being, goal-setting and problem-solving skills, and positive thinking patterns.

Across the interventions outlined in the systematic reviews and meta-analyses, the Mental Health Continuum-Short Form (MHC-SF; Keyes, 2005) was the most commonly used measurement instrument used to assess mental health. The MHC-SF total score has demonstrated good internal consistency ($\alpha > .80$) and discriminant validity in many samples (e.g., Keyes et al., 2008; Lamers et al., 2012; Luijten, Kuppens, van de Bongardt, & Nieboer, 2019). Other measures used in these studies include the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), Generalised Self-efficacy scale (Schwarzer & Jerusalem, 1995), and the Patient Health Questionnaire-9 (Kroenke, Spitzer, & Williams, 2001).

2.2.2 Step 2: MRC development: Program outcomes, performance objectives, and determinants of change.

Objective and methods. In the second step, we aimed to specify and determine the program outcomes (i.e., who or what will change as a result of the intervention); the performance objectives (i.e., what program participants must do to achieve these outcomes); and the determinants of change (i.e., factors associated with performance of behaviours). We determined to select a wide range of daily behavioral outcomes that were more empowering, acceptable, and feasible in the target group. In discussing potential behaviour change techniques and the most appropriate program

implementation methods, the research team was guided by the taxonomy of the behaviour change techniques (BCTs; French et al., 2012). The research team brainstormed to identify a set of behaviors associated with the promotion of positive mental health and well-being among vulnerable groups. Considering the study context and the vulnerability and economic deprivation of the target population, we identified psychological outcomes, such as promoting a sense of enablement and resilience, in order to empower participants through the behavioral change process. For each outcome, we created specific performance objectives by breaking down the program outcomes into smaller and observable actions. Based on the list suggested by Michie, Johnston, Francis, Hardeman, and Eccles (2005; which is judged appropriate to effect change for the selected domains) and on the authors' previous research, clinical, and educational experiences, we formulated specific actions (determinants of change) that can be implemented to achieve each objective. The formulation was guided by the view that activities and exercises that are based on the principles underlying the proposed program have the potential to lead to positive changes in the thinking pattern and behavior of program participants.

Outcome. The team concluded on the following key behaviors to appropriately promote mental health and well-being for the target group, as evidenced by findings from previous studies (e.g., Bolier et al., 2013; Hendriks et al., 2019; Weiss et al., 2016). They include: (1) practicing self-acceptance, (2) showing kindness and compassion to self and others, (3) living a meaningful and purposeful life, (4) cultivating positive relationships, (5) pursuing personal growth (self-improvement), (6) setting and attaining personal goals, (7) developing problem-solving skills, and (8) identifying, challenging, and replacing unhelpful thinking patterns with positive ones. The research team deliberated on the selected behavioral targets to determine the most appropriate method (i.e. mechanism and techniques of change) to convey them. Based on general evidence of its ability to facilitate behavior change and on previous research that pre-assigns BCTs (see Cane, Richardson,

Johnston, Ladha, & Michie, 2015) to each of the domains of the Theoretical Domains Framework (TDF; Michie et al., 2005), we selected specific domains from the TDF to identify the most appropriate determinants of behavior change (i.e., intervention functions). The 12-domain TDF model has been widely used to identify relevant determinants of behaviour change in previous research (e.g., French et al., 2012; Tavender et al., 2015). For the current study, we selected five domains: knowledge, attitudes, self-efficacy, social support, and skills to facilitate the behaviour change process. Five BCTs were carefully selected to match the five intervention functions, which were deemed necessary to promote mental health and well-being in the target group: prompt/cues, demonstration of the behavior, feedback on behavior, group discussions and activities, and behavioral practice/rehearsal. Table 1 presents the performance objectives, determinants of change, theoretical methods and practical applications in the ILP intervention program.

2.2.3 Step 3: MRC development: Define the content, structure, and implementation strategy.

Objective and methods. The objective of this step was to determine the content, structure, and implementation strategy of the proposed intervention program based on a review of existing evidence and expert meetings with researchers and practitioners. We reviewed the recommendations by previous researchers (e.g., Friedman et al., 2017; Ho, Yeung, & Kwok, 2014; Watt et al., 2015), insights from expert researchers and practitioners, and outcome from the review of models and literature from Step 1 to select the content, structure of sessions, and the implementation strategy of the proposed intervention program. We reviewed empirical literature and interventions, particularly PPIs from the African context and of lay perspectives on well-being in Ghana, to select the most appropriate constructs and themes to guide in framing the content of the intervention, identify the most practicable approach in structuring the sessions, and strategize the implementation of the program. Relying on evidence and insights from these reviews, the research team engaged in structured discussions to brainstorm, identify, and draft outlines for the key contents and intervention

Table 1: Performance objectives, determinants of change, theoretical methods and practical applications in the ILP intervention program

Performance objectives		Determinants of change	Selected behavior change techniques	Practical application (Delivery strategy)
1	Understand the behavior (i.e., experience of positive mental health) and psychological outcomes (i.e., enablement, resilience)	Knowledge (i.e., appreciate the link between mental health and functioning/satisfaction with life, awareness of current behaviors that promote or impede positive functioning, health consequences of performing the behavior)	Provide information (e.g., written, verbal, visual) about behavior (i.e., experience of positive mental health); monitor and provide informative or evaluative feedback on performance of the behavior; prompt practice or rehearsal of the performance of the behavior.	Facilitator-led discussion; group brainstorming and discussion
2	Identify the link between positive mental health and well-being as well as functioning (e.g., vocational productiveness)	Attitudes (i.e., understand the short- and long-term effects of specific thinking patterns, feelings, and behaviors)	Provide information about practical strategies and links among events, thoughts, feelings, and action/behavior; advise on ways to reduce negative emotions to facilitate experience of positive functioning; analyze problem and generate or select context-relevant, practicable, and effective solutions	Facilitator-led discussions; group discussions and activities
3	Evaluate the present situation (i.e., self-assessments, self-monitoring, personal growth)	Self-efficacy (i.e., confidence in one's capabilities and abilities)	Prompt identification of impediments to personal growth and development; set a goal defined in practical and realistic terms to overcome identified barriers.	Facilitator-led practical activities; group brainstorming and discussions
4	Increase motivations and desire for change (i.e., identify personal reasons for desiring to change/flourish)	Social support or encouragement (i.e., general, emotional, and practical social support among group and community members)	Advise on, facilitate, or provide development of general, emotional, and practical social support for performing and achieving the behavior	Facilitator-led discussions; individual reflections; group brainstorming and discussions
5	Identify practical strategies to identify and overcome challenges of everyday living	Skills (i.e., learning about, and practicing life skills to facilitate behavior change and promote mental health)	Prompt goal setting; provide general support and encouragement; prompt detailed planning of performance of behavior; establish method for individual to evaluate performance of skill	Facilitator-led discussions and demonstration; group discussion and skill demonstration

activities. The resulting themes and emerged content were thoroughly reviewed to determine how they could be constructed and conveyed to participants.

Outcome. Overall, nine themes were carefully selected to promote specific facets of mental health. Six themes were based on positive psychology, namely cultivating self-worth and self-acceptance (i.e., individuals' recognition of their strengths and acceptance of weaknesses and working to improve one's self; Keyes, 2002; Ruini & Ryff, 2016); meaningful and purposeful living (i.e., developing a sense of purpose and meaning in life, setting life goals, and developing a sense of direction; Keyes, 2002; Martela, & Steger, 2016); positive relationships (i.e., exploring the features of positive relationships and increasing awareness of different ways our responses can affect them; develop skills to enhance dimensions of personal relations; Keyes, 2002; Proyer et al., 2015); personal growth (i.e., identifying dimensions of personal growth and promoting personal growth goals, e.g., spiritual, relational, intellectual and physical; Keyes, 2002; Ruini & Ryff, 2016); kindness and compassion (i.e., promoting a sense of self-compassion and kindness and how to foster them; Curry et al., 2018; Keyes, 2002); and positive thinking (i.e., identifying and reinforcing values and practices that promote positive mental health; highlighting positive events or situations and engage in positive suggestions; Eagleson, Hayes, Mathews, Perman, & Hirsch, 2016; Keyes, 2005).

Three additional themes were also drawn from the cognitive-behavioral model, namely, problem-solving skills (i.e., developing problem-solving and stress coping skills that promote flourishing; Beck, 2011); time management and goal setting skills (i.e., nurturing a sense of and skills in effective time management and cultivating goal setting skills; Beck, 2011); and cognitive restructuring (i.e., understanding the relationship between thoughts, feelings, and behavior and identifying and challenging unhelpful thoughts that interrupt with positive experiences; Bannink, 2014; Beck, 2011). We deliberated on several factors that could improve the structure and delivery strategy of the proposed group-based intervention program and what could stimulate interactivity and

participation. Based on a taxonomy of BCTs and evidence demonstrating relationship between BCTs and the effectiveness of health interventions (e.g., Craig et al., 2017), we selected a range of BCTs (e.g., providing information about the relationship between behavior and health, cultivating problem-solving and goal setting skills, providing general support and encouragement) to facilitate the behavior change process. The interactive group discussion and activity session mode of delivery was selected to deliver the content of the ILP intervention program. Other group-session related factors, such as nurturing group cohesion, managing conflict among participants at sessions, creating an atmosphere that supports appropriate emotional expression, and dealing with potential emotional and physical tensions in a timely and thoughtful manner were also discussed and incorporated into the draft. A draft of the outline of the key themes, specific contents, and session activities that integrates the group-session related factors listed above was prepared.

2.2.4 Step 4: MRC modeling process and outcomes: Community consultation and content evaluation.

Objective and methods. The objective of this step was to conduct focus group discussions (FGDs) with selected individuals from the target population to appraise the proposed content, structure of session, and implementation strategy in order to match the ILP to the needs of the target group. To bolster the likelihood that the ILP would be matched to the needs of the local communities, individuals from two randomly selected communities from the target population were recruited to appraise the proposed content and to suggest revisions to refine the proposed ILP intervention program. Community leaders (i.e., chief and elders) were consulted in each community to facilitate the community entry process and to obtain permission to recruit participants for the FGDs, through the assistance of trained independent mediators. FGDs were organized for individuals who consented to participate – to elicit their views on the proposed content; comprehensibility, relevance, and

applicability of themes and lessons to participants; and the structure and implementation strategy. Feedback from the interviews was carefully evaluated and integrated into the program sessions.

Twelve adult individuals, comprising six males and six females were each recruited from the selected communities. The aim of the program was explained to participants and their concerns clarified. For each session, which was facilitated by the first author and a trained co-facilitator, participants were led to discuss and rate the relevance and practicality of the theme and lesson (content), the proposed structure, as well as the implementation strategy as “clear” or “unclear”, and to share what they thought the session was about. Participants were also tasked to comment on the relevance of the lessons and skills of the sessions and to indicate which aspects of the session, phrases, or words they did not understand, found unacceptable, or offensive – and to suggest a revision.

Given the patriarchal social orientation and cultural norms of the communities, we held separate FGDs for each gender group – to enable female participants the liberty to interact freely and share their views without hesitation. As was customarily required in the cultural context of this study, a male community elder was delegated by the chief to be present when the team held the FGDs with the female groups. This was discussed with the female groups, including the agreed protocols to guide the participation of the delegated elder, such as sitting silently at the back to ensure that his presence does not influence the members’ participation at the sessions. Participants unanimously agreed that the delegate joins the sessions.

Outcome. The qualitative data from the FGDs, analyzed thematically with an inductive approach by the first author – for the sole purpose of improving on the program – suggest that participants generally considered the proposed themes and activities as important and relevant to improve their mental health. Participants were also appreciative of the fact that aspects of the proposed program focused on increasing their social skills to enhance their vocational productivity.

The FGDs also offered participants the opportunity to propose more nuanced practical example situations for specific themes and discussions. Overall, the results suggested that interventions to support the promotion of mental health in this context needed to be practically-oriented and focused on the needs of participants, should encourage in-session demonstration of learned skills or lessons, and must provide opportunities for participants to apply the acquired knowledge and skills at home. The results further indicated that a multi-level intervention that targets the individual participant, as well as their social interactions with colleagues and families, might be most effective to promote the mental health of participants. In addition to appraising and generating ideas to refine each theme, participants also discussed some contextually-relevant example situations that align well with the themes of each session and contributed to exploring the best approach to organizing and implementing the intervention.

2.2.5 Step 5: MRC modeling process and outcomes: Simulation of intervention sessions.

Objective and methods. The objective of this step was to simulate draft sessions with a group of psychology graduates to practicalize and identify possible challenges with communicating the lessons in the session themes and to appraise the structure and the intended implementation strategy of the sessions. Twelve individuals (including eight bachelor and four graduate psychology students) were invited to simulate the draft sessions. All participants were native Twi-speakers (which is the language spoken in the target-population) and were well accustomed to the cultural norms and context of the target population. Participants were tasked to critique the contents of each session and to contribute to strengthening the draft program. The simulation sessions also sought to explore the most suitable manner in which the sessions could be presented in order to optimize the impact of the intended lessons for the target population. Together with a trained co-facilitator, the first author presented the draft intervention program sessions, using interactive group discussions and activities, to participants who acted as the target participants. Three of the participants were

previously involved in community-based mental health researches. Two trained assistants took field notes by carefully observing and documenting the session proceedings.

Outcome. The field notes were first scrutinized and examined in detail by the first author and co-facilitator to familiarize themselves with the text and deepen their understanding of the views of participants. Since participants shared their views on particular themes through the session proceedings, main points and suggestions for each discussion were extracted, evaluated, and used to inform the revision of the program. Overall, participants pointed out aspects that needed more clarifications, suggested alternative Twi phrases that best represented the constructs, and offered contextually-appropriate example situations for each session. For instance, participants suggested a pictorial demonstration to explain how an appraisal of a particular event leads to the exhibition of a corresponding feeling or mood and subsequent behavior – to explain the relationship between thoughts, feelings and behavior. A case example was also suggested to complement the illustration. All comments and suggestions were noted and carefully considered in the subsequent revision of the intervention program. The revised version of the program was presented again to participants in the following week, where further comments were made. The exercise enabled the research team to estimate the duration for each subsection of the sessions, revise the structure and delivery strategy, situate breakout and plenary sessions, and to anticipate and provide appropriate responses to possible questions from participants.

2.2.6 Step 6: Feasibility: Expert review.

Objective and methods. The objective of the sixth step was to invite subject experts to evaluate the program in terms of its feasibility, acceptability, practicality, and potential impact. After a thorough review by the research team, the draft program was submitted to a group of subject experts to review the manualized draft intervention program and to suggest revisions to improve the program. The research team invited independent researchers and practitioners who were well-versed

in the theories, concepts, and principles underlying the ILP to critically review the program. Expert reviewers ought to have previous experience of developing psychological intervention programs for vulnerable populations. Feedback from experts was considered and used for further revision of the intervention program.

Three psychology researchers who were not involved in the initial conceptualization of the program were invited to review the sessions. The first reviewer, a South African trained in positive psychology, had previous experience with developing and implementing mental health promotion interventions for individuals across Africa. The second reviewer, a Ghanaian, was a clinical psychologist whose research interest focused on generating and evaluating mental health interventions in rural poor settings in Ghana. The third reviewer, also a Ghanaian, had a health psychology orientation and extensive experience working with vulnerable populations in Ghana.

Outcome. Reviewers provided a critical evaluation of the intervention program and made a number of recommendations. It was suggested, for example, that additional breakout sessions should be included, where participants take turns to further discuss the lessons and practice exercises. Reviewers also recommended that the time allocated to group interactive discussions and exercises should be increased, considering that participants may not be able to not make notes of the session proceedings as the majority of people from the target population are unlikely to have received any formal education. Lastly, there were suggestions to provide additional sections within each session for practical activities, where participants further discuss key lessons and how they can incorporate the lessons and skills into their daily activities, using contextually-relevant and relatable case examples.

2.2.7 Step 7: Piloting: Pilot-testing and final review of the intervention program.

Objectives and methods. The objectives of the seventh step were to pilot-test the program in order to evaluate the strategies outlined to: (1) select and recruit participants, (2) facilitate the

group intervention sessions and appraise the content of the sessions, and (3) to motivate compliance and retention and solicit feedback from participants and session facilitators. We randomly selected 20 individuals, comprising of five males and five females each from two communities from the target population, to participate in a pilot study after community entry protocols and individual consents were obtained. Ethical approval documents and authority notes obtained from the Regional Health Directorate of the Sunyani West District were presented to community leaders for permission to recruit participants in the communities for the study. All selected individuals were informed about the aim and nature of the intervention program sessions. Only individuals who provided verbal and written (or thumb-printed) informed consent were recruited. The two male facilitators who delivered the program were psychology graduates and native Twi-speakers (which is the native language of participants). Both facilitators had previous experience in delivering behavior change intervention program sessions to adult participants in rural communities. One facilitator was involved in the community appraisal and session simulation phases of the program development. The first author, who is a trained psychologist with previous experience in community-based mental health promotion interventions, provided a one-week intensive training on the 65-page ILP manual (with key words translated into Twi) and group management skills for the two facilitators, prior to the commencement of the pilot study. The first author also supervised a one-hour rehearsal of each session before they were delivered the next day. Ten two-hour, once-daily, five days per week closed group pilot sessions were organized for participants for two weeks. We undertook two rounds of interviews with participants to evaluate the presentation strategy and contents of the sessions, and how well the sessions and activities were understood or were relevant to participants. Participants were asked to describe their understanding of each session and to suggest a revision, using appropriate and context-relevant examples. Feedback was reviewed after each round of interviewing and changes made to the text. The program manual was revised and re-formatted to allow for easy reference on the field.

Outcome. The two-hour, 10 interactive group discussion and activity manualized sessions were delivered by two trained co-facilitators, and supervised by the first author. All sessions were held in a vacant primary school classroom and a church premise and delivered by the same facilitators. Tables and chairs were provided by participants and arranged in a semi-circular pattern, facing the facilitator. Rooms were well lit and ventilated. At the beginning of each session, participants reviewed the rules of engagement, which included confidentiality, respect for each other's views, attending sessions on time, and completing home assignments and sharing findings with group members at the next session. The ILP is designed to be supportive, participant-centered, and interactive. Facilitators forged strong relationships with group members that enabled participants to discuss and share personal experiences that they might otherwise find difficult or embarrassing to discuss outside the session context.

Given that most participants could not read or write in English, the agenda and key sections of each session were written on a flip chart in the native language (i.e., Twi) in which the intervention was delivered and mounted to face participants. Notepads and pens were made available to participants who could write or had someone to copy the information for them at a later time. The co-facilitator wrote down keywords from participants' contributions on the flip chart during plenary sessions, as necessary. Sessions were held separately for each gender group – since the communities were patriarchal – to encourage female participants to freely share their views. Each group comprised of 10 members aged from 18 to 60 years. To ensure high compliance and retention, the following measures were instituted. First, we allocated adequate time to explain the intervention program and anticipated benefits to participants. Second, we collaborated with participants to explore the most suitable time slots to hold the intervention sessions. Participants preferred, considering their farm work schedules, to attend sessions either early mornings or late afternoons, excluding community meeting and market days. In the few instances where a session conflicted with important social

events, facilitators deliberated with participants to reschedule the entire session. Participants were served with water at sessions and provided with session gifts such as a pack of washing powder, bar of soap, or packet of sugar worth GHS 4.50 (about $1) at the end of each session as a token of appreciation.

We found the need to include a few pre-sessional activities, such as asking a volunteer participant to sing a favorite song or tell a short story or an appropriate, funny joke at the beginning of each session. Simpler, summarized 'field guides' that highlight key aspects of each session were also provided to facilitators, in addition to the main program manual, to allow for easy reference as needed, during the sessions. Session facilitators completed a brief daily questionnaire about attendance, participants' engagement in the sessions, and their ability to follow the sessions and carry out skills. In addition, the supervising psychologist attended all sessions to observe and assess fidelity to the intervention, completed an observation checklist, and discussed any findings with the facilitators in a debrief session immediately after each session.

Qualitative evaluation of the pilot study suggests that the ILP is applicable to the target context. The majority of participants (93%) attended all ten sessions. Participants reported that the discussions and exercises were easy to complete, have contextual and practical relevance, and provided a forum that enhanced their sense of well-being. Participants' experiences also indicated that the ILP provided a peer-learning opportunity that led to improved self-awareness and acceptance, positive relationships, inspired the pursuit and attainment of goals, and enhanced positive states of mind and feelings. The effectiveness of the ILP has since been evaluated in a larger study within a quasi-randomized controlled trial and reported in another manuscript (Appiah et al., 2020). Overall, the pilot study led to some minor modifications to the session activities, implementation strategies, and the preparation of summarized field notes for the facilitators. The final manualized 10-session

ILP intervention program includes a synopsis and preliminary pages that introduce the rationale and aim of the ILP.

3 Results

We describe the objective, content (i.e., themes and activities), and implementation strategy for each session of the ILP intervention program in line with reporting guidelines for a structured and systematic description (see Borek et al., 2015). Each session comprises of a specific topical focus that is intended to promote mental health and reduce symptoms of psychopathology. All the sessions were designed to stimulate interactive discussions and activities and can be delivered by two trained (non-specialist) facilitators in a group setting for approximately 120 minutes, using plenary and breakout sessions. The structure and content of the ILP intervention program were sequential, with each session building on the foundation achieved in the previous sessions. Initial sessions were structured to focus on more easy lessons and successively to more complex ones. Table S1 in the electronic supplementary material presents the reporting elements for the group-based ILP intervention program as specified in Borek et al.'s (2015) guideline.

3.1 Session One: Introduction and Dimensions of Well-Being

The main objectives of this session are to provide a framework for establishing rapport with participants, introduce participants to the intervention program, and provide guidelines for collaborating with participants to set group norms and rules to regulate sessions. The session also discusses (positive) mental health and well-being and its dimensions and relevance, using contextually-relevant examples. The session begins with a paired-up activity, where participants take turns to ask for their partner's name, occupation, marital status, leisure activities, name to be called at sessions, and one interesting thing about the partner. Each member then introduces their partner to the group, based on the solicited information. Subsequently, facilitators re-emphasize the overarching goal of the program and clarify participants' concerns. Facilitators generate a discussion about rules

of engagement for the meetings and allow members to suggest group rules and expectations. These include confidentiality, prompt attendance to sessions and completion of homework assignments, being supportive to one another, and choosing a group motto (with a response) that is periodically cheered to enliven the sessions. In a five-minute breakout exercise that follows, participants are led to introspect and imagine their best possible selves. Participants reflect on specific questions, such as *"What specifically would I like to be happening in my life (e.g., three weeks, six months, one year from now)?"* and take note of their feelings and share with the group. Thereafter, facilitators lead a discussion on the meaning and dimensions of *mental health* and *psychological well-being*, citing contextually-appropriate examples that participants could relate. Participants thereafter discuss what (positive) mental health and well-being mean to them and their importance in human functioning. In another breakout reflective exercise, participants recount in detail and discuss with their partner something good they did – either to a friend, an animal, a stranger or even if they did not even know who it would benefit. To conclude the session, the facilitators lead participants through a deep breathing relaxation exercise and progressive muscle relaxation (PMR) to reduce muscle tension and decrease distress. Participants are asked to practice this exercise daily before the next session. During the community engagement phase of the intervention development, participants expressed a need for an exercise or activity to relax and relieve stress after a hard day's work. In a plenary session, facilitators lead participants to review the key themes and lessons, address participants' queries, and discuss homework assignments. A brief overview of the main theme of the next session is then presented to participants. The session ends with participants taking turns to describe their experience or views about the session.

3.2 Session Two: Accept Yourself

The second session, and all subsequent sessions, begins with participants welcoming each other and exchanging pleasantries. This is followed by an icebreaker, where a member volunteers to tell a short but interesting story or joke, sing a favourite song, or share a memorable experience that occurred in the past week. Facilitators lead the discussion of homework assignments, wherein participants take turns to share their findings and experience with the group. The session agenda, which is displayed on a flip chart, is discussed with participants. The aim of the second session is to guide participants to recognize (identify) their strengths and accept their weaknesses and explore how they can improve their strengths to facilitate their personal growth. In the FGDs held with community members to appraise and refine the contents of the sessions, participants noted that the prevailing socio-economic and life difficulties invariably results in their experience of low self-esteem and poor self-image. The main session commences with a paired-up activity which tasks participants to reflect on three questions, such as: *"What healthy, desirable life circumstances and conditions were you born into that many people in the world do not or did not have?"* In a breakout session, participants share with a paired-up partner about what they think about themselves, or what thoughts come to mind when they think of who they are as a person. Subsequently, participants are guided to deliberate on how they can improve or practice self-acceptance. Each team takes a turn to share their views with the rest of the group as facilitators write key points from participants' contributions on a flip chart. A list of the 24 *Virtues In Action* character strengths (translated into Twi) is displayed on a flip chart. For each identified strength, participants mention everyday activities or situations where these character strengths can be applied. For the concluding activities, as with all subsequent sessions, facilitators solicit for feedback on the PMR and deep breathing exercise; review the key lessons and activities of the session; discuss homework; present a brief overview of the main theme for the next session; and have each participant say a word or sentence which expresses how they experienced the

session. For the homework assignment of this session, participants identify a quiet place, perform a deep breathing exercise or PMR and reflect on the factors and issues preventing them from accepting themselves. They then look in the mirror, each day until the next session, and communicate a loving and non-judgmental acceptance to themselves. Participants observe their feelings and share their experience in the next session.

3.3 Session Three: Be Compassionate and Kind

The overall goal of the third session is to teach participants to cultivate and promote a sense of self-compassion and kindness. Results from the FGDs and pilot study reinforced the need for participants to be more gentle and kind to themselves and others. The session commences with facilitators generating a discussion on what self-compassion and kindness mean to participants and how these can be translated to promote their well-being. Subsequently, participants are put into two groups (i.e., five members each) to explore external factors (e.g., environmental and daily activities) as well as internal factors (e.g., personal thoughts, feelings, beliefs, and memories) that prevent them from being compassionate and kind to themselves. This is followed by a plenary discussion, where facilitators narrate a life situation that did not go so well and how their inner voice criticized them, and how they felt afterwards. In a subsequent paired-up activity, participants discuss an unpleasant situation they recently experienced, how they criticized themselves, and how they would have responded if it was told to them by a friend. In a follow-up plenary discussion, participants discuss why it is important to be kind to other people and themselves and how an act of kindness could lead to increased well-being and fulfillment. Working together as a team, participants generate a list of three acts of kindness activities they wish to do each day that will positively impact others, which could also cause them to feel good about themselves. This is followed by the session concluding activities. For their homework assignment, participants are tasked to identify a quiet, private space, perform a cycle of PMR or a deep breathing exercise, reflect and say ten positive words of

affirmation to themselves. These words should relate to self-compassion and kindness and can include phrases such as: *I will be kind to myself and others now and at all times; I will forgive myself and others now and at all times; I will be strong now and at all times; I will be compassionate to myself and others now and at all times; I will accept myself as I am now and at all times; I will be patient with myself and others now and at all times*.

3.4 Session Four: Nourish Your Relationships

The goal of the fourth session is to lead participants to explore the features of positive relationships and increase participants' awareness of different ways their responses and behaviors can affect their relationships, as well as generate specific strategies to strengthen social relationships. The session begins, after the introductory activities, with a paired-up activity where participants describe and share their experiences of what a good relationship is, and why it is important to nurture a good relationship. In a plenary session, each participant discusses why it is important to nurture good, quality relationships at home, workplace, and in the community. Facilitators generate a discussion on the features of a positive relationship and have participants mention what they consider as important ingredients of a positive relationship. In a breakout exercise, facilitators put participants into groups of three and task each group to discuss the challenges with nurturing positive relationships with their family, neighbors, colleagues at work, and community members, and how they can overcome these challenges. Facilitators briefly discuss how quality relationships can help them to stay positive, healthy, and feel more connected to others. This is followed by the session concluding activities. For homework, participants are tasked to identify two people in their nuclear family and two in the community and express how much they appreciate something specific that they have done and how they value their friendship/relationship.

3.5 Session Five: My Meaningful and Purposeful Life

The goal of this session is to teach participants to cultivate a sense of meaning and purpose in their lives. After the introductory activities are completed, facilitators ask participants to mention activities in the past that have created a great deal of inner satisfaction and joy for them. In a reflective mood, participants are tasked to think about what makes them '*come alive*' by reflecting on what they are passionate about; what brings them joy; and what they find themselves doing in their leisure time. Subsequently, facilitators solicit for participants' views on what brings meaning and purpose to their lives; and what they can do to attain this goal. Facilitators generate a discussion about the importance of setting personal goals to enhance meaningful and purposeful living. In a five-step activity (written on a flip chart), facilitators task participants to brainstorm three goals that are meaningful to them; discuss the possible ways to achieve them; and discuss some expected challenges they may encounter and how to overcome them. In a breakout activity, participants sit comfortably and take a few slow breaths to clear their minds and perform the following exercise: (1) reflect on their past life experiences and identify two areas in which growth has occurred (e.g., where they increased in their self-awareness [perception of their strengths, weaknesses, thoughts, beliefs, motivations] and made positive growth either with themselves, in their family, or at work); (2) relate these experiences with specific life examples; (3) frame a story about these experiences that exemplifies how they would like their future experiences to lead them to a satisfying, meaningful lives. This is followed by the session concluding activities. The homework assignment tasks participants to identify two things that they value which can also contribute to making life meaningful and purposeful for them. Participants then make a plan to do them, reflect on the outcome, congratulate themselves for doing them, and think of how these make their (and others') lives more meaningful, happier, and fulfilled.

3.6 Session Six: The Fruitful Life

This session aims to teach participants some psychosocial skills to manage the challenges they confront in their daily lives. After the introductory activities, the session commences with a paired-up activity where participants brainstorm answers to the following questions: (1) do we need to have goals for our daily activities and why is that necessary? (2) what should be included in our daily goals? (3) what does time management mean to you and why is it important? (4) in which ways can we manage our time effectively for the best outcomes? Each pair shares their feedback in a plenary session, where the co-facilitator writes the key points on the flip chart. Facilitators explain *goals* and what *goal setting* entails, using words and phrases that participants could understand. This is followed by a discussion on the importance of goal setting and the 6 "W" questions of goal setting (i.e., what, why, who, where, which, and when). Facilitators clarify that goal setting helps us to improve on various aspects of our lives, including that it makes us focused and committed to achieving the end results and serve to energize and stimulate us to make extra efforts to achieve our goals. Facilitators discuss how to set a *SMART* (i.e., specific, measurable, attainable, realistic, and timely) goal, by discussing in detail what each letter in the acronym represents. Each participant is asked to discuss what they would consider in setting a SMART goal and which of the characteristics of goal setting they find the most challenging.

This is followed by a discussion on time management where participants share how they usually spend their time and whether or not they think they use their time effectively. In a breakout session, participants discuss the following: (1) what *time robbers* are, and how they can identify them; (2) how to make good use of their time; and (3) how to determine if an activity is worth their time. Each group shares their feedback at the plenary session. This activity is followed by a practical demonstration of the *Empty Jar Demonstration*, which involves arranging a quantity of medium-sized rocks, small pebbles, and sand in two large transparent glass jars – one in the order in which the items

were listed and the other in a reverse order. The material in the first jar appears well arranged and has space to take more, compared to the second jar, although both jars were filled with the same quantity of materials. Participants are asked to discuss the significance of the demonstration and draw lessons from it. This is followed by the session concluding activities and a homework assignment, which requires participants to reflect on four activities or situations that 'rob' their time. Participants then use their knowledge of goal setting and time management skills to guide them to prioritize and plan their activities to make better use of their time.

3.7 Session Seven: Reaching Beyond

The goal of the seventh session is to teach participants the need for, and how they can enhance their skills in the dimension of self-improvement (i.e., personal growth). In a paired-up exercise after the introductory activities, participants deliberate on an activity or event that could bring them and three other people together in a meaningful way. The activity must also have an economic value or lead to increased productivity with a layout implementation plan. This is shared with the group in a plenary session. Facilitators thereafter generate a discussion about the importance of working to increase our strengths and positive attributes such as gratitude, developing a useful skill, or leading in a group, while also making efforts to change the negative, unhelpful attributes. Participants identify some good and positive strengths (characteristics) they wish to nurture further, as well as some unhelpful, unproductive attributes they wish to change. Facilitators lead a discussion on personal growth, using words and phrases that participants could understand. 'Growth' is analogized with how a farmer plans and makes efforts to prepare a piece of land, plant crops, clear weeds, and see the crops mature for harvest. Facilitators explain that personal growth is a process that can include learning something new, developing a craft or skill, cultivating more hope, engaging in more religious activities, or using time more efficiently that supports a person's advancement and overall well-being. In a follow-up breakout session, participants are tasked to discuss which areas or

aspects of their lives they wish to improve and how best they can work to achieve their desired goals. In a plenary session, participants reflect on the items on the *Personal Growth Initiative Scale – II* (PGIS-II) – a self-report instrument that assesses an individual's personal growth initiative. Participants sit silently, with eyes closed, as facilitators slowly read out the items (in Twi) under the various subsections of the scale. Participants think deeply of each statement, reflect, and assess how the statements apply to them. This is followed by the session concluding activities. For their homework, participants are tasked to select one of the goals they have discussed and take actions to implement it to improve their personal growth.

3.8 Session Eight: Resilient Mindset

This session aims to teach participants to develop problem-solving and stress coping skills. The main session, after the introductory activities, begins with a paired-up exercise, where participants brainstorm some ideas to the following questions: (1) what are the common challenges you encounter in your everyday living? (2) how do you handle/cope with these challenges? (3) how do you plan (strategize) when working to solve your daily life challenges? Each pair shares their responses in a plenary session. Facilitators then generate a discussion about resilience and the importance of developing a resilient mindset, using contextually-appropriate examples. Facilitators lead participants to discuss the key aspects of resilience, including external supports and resources, social and interpersonal skills, and personal qualities and strengths. Participants are thereafter guided through a process of identifying and reconnecting with their unique, and often overlooked, core strengths. Facilitators explain that our ability to withstand or thrive in the midst of life's difficulties is a skill we must learn and this can be done by identifying and building up our mental and physical strengths.

In groups of three, participants discuss the strategies they often employ to overcome their daily challenges and other coping strategies and skills they wish to try or develop. Using a case

example, facilitators discuss the six-step problem-solving skills (i.e., identify the problem, analyze the problem, develop the solutions, implement a solution, evaluate the results, and standardized the solution and capitalize on new opportunities). In a plenary session, each participant formulates a problem and discusses a possible solution using the six-step problem-solving skills. Each participant identifies the part of the *problem-solving process* that they find the most challenging. The group contributes to discuss each identified challenge and suggest ways to overcome them. This is followed by the session concluding activities. The homework assignment for the session involves a case scenario of a 49-year old farmer in need of financial advice to pay his debts and expand his farm in the next farming season. Participants are required to discuss the case scenario with three friends or relatives and develop a plan together to assist the farmer, taking into consideration his resources (e.g., farmland and crops) as well as his debt to the local credit union.

3.9 Session Nine: I am in Control

This session aims to teach participants to understand the relationship between thoughts, feelings or emotions, and behavior and to identify and challenge unhelpful thoughts that interrupt positive experiences. After the introductory activities, facilitators generate a discussion about how an individual's daily experiences shape their well-being. In a paired-up exercise, participants brainstorm the most common positive and negative experiences they encounter regularly and how these events lead them to think, feel, and behave in a particular way. Participants also discuss some unhelpful thinking patterns they often experience, how they interfere with their positive experiences, and the methods they often employ to overcome them. Outcomes are shared with members in a plenary session. Using a case example, facilitators explain the relationship between events, thoughts, feelings or emotions, and behavior. From a flip chart, facilitators explain a pictorial illustration of an event, possible thought(s) that follows the event, the feelings these thoughts might elicit, and the possible associated behaviours (actions) to these feelings. In a subsequent group discussion, facilitators read a

story and ask participants to identify the event (situation), the possible thoughts the story can generate, the possible associated feelings, and possible behaviors that could occur. Facilitators explain that whereas some thoughts make it more likely that we will become sad; others make it less likely that we will become happy. However, being aware of our feelings and thoughts is the first step towards feeling better. If thinking influences feeling, then it makes sense that if we want to change the way we feel, we have to change the way we think.

Using example situations, facilitators discuss nine unhelpful thought patterns (thought distortions) that decrease our positive experiences and feelings. Facilitators explain that we can evaluate and challenge our unhelpful thoughts using the *Worry Tree* method. Here, participants are taught to analyze their problems by taking into consideration all available resources and constraints. This helps to lessen their anxiety and stress of thinking about the problem. Facilitators further explain that the *Worry Tree* helps us to think about our problems and generate a plan to solve them. This is followed by the session concluding activities. The homework for the session requires participants to engage with three people in their community (i.e., family or friends) and explain the Worry Tree method and how it can help to reduce anxiety and stress when they face challenges – by changing the focus of their attention when they cannot do anything about a problem, or how to plan to solve those problems that can be solved. The program participant guides the individual to use the Worry Tree method to explore a solution to a recent challenge they encountered.

3.10 Session Ten: Joining the Dots

The final session provides a general review of all key lessons and activities of all nine sessions. After the introductory session, each participant shares with the group the lessons and skills they acquired from each session and briefly describes how the sessions have benefitted them, overall. In a breakout session, participants discuss how the knowledge and skills acquired through the training could impact their well-being and productivity. Members of the groups contribute to support each

person's expectations of how the lessons and skills from the training could be utilized to promote their mental health, build their resilience, and increase their productivity in their farms and workplaces, homes, and communities. Subsequently, participants take turns to discuss aspects of the training they found difficult to understand or apply in their daily activities aspects that were easy to understand or apply. Facilitators clarify and provide appropriate support and commend participants for their contributions and encourage them to work to apply these knowledge and skills.

Facilitators thank participants for their participation, efforts, and support through the training sessions. Subsequently, participants share their fond memories and complement each other for their efforts and contribution. Participants are then awarded certificates for their participation – which also serve as a reminder for them to utilize the knowledge and skills they acquired from the program. Participants join in to sing and dance to songs. Group pictures are taken and parting gifts are shared to participants. Facilitators express their appreciation to participants, once more, and formally inform them that the training sessions have been completed. Facilitators remind participants that members of the research team will visit their homes the following week (and three after months) to ask them questions about their experience of the program.

4 Discussion

This paper describes the development of a novel, 10-session mPPI – the ILP – designed to promote mental health and reduce symptoms of depression and negative affect in rural adults in Ghana, by applying the MRC's framework for developing and evaluating complex interventions. We describe the iterative program development process and the initial evaluation exercise to determine the feasibility of the program – in terms of its implementation and potential impact and to refine intervention parameters based on findings that emerged. We also describe the final intervention package in line with reporting guidelines for a structured and systematic description (see Borek et al., 2015), and reflect on the challenges and lessons from the development process in the study context.

We operationalized and mapped the various activities to the first three stages of the MRC's framework to develop and pilot-test the intervention program.

4.1 Study Strengths and Limitations

We identified a number of strengths from applying the MRC and TDF frameworks in the development of the ILP program. Firstly, the '*development*' phase of the MRC framework (i.e., identifying the evidence base, identifying/developing theory, and modeling process and outcome) provides a useful guide to engage stakeholders in the intervention design process. Although the study objectives were determined *a priori*, the MRC approach prompted an engagement with participants from the target population as well as with graduate students to appraise and refine the proposed content and implementation strategy. These engagements were important in safeguarding the practicality of the program and in embedding the intervention within the context in which it is to be implemented (i.e., context-relevance), and thus increased the potential effectiveness of the intervention.

Secondly, the MRC framework guaranteed that the ILP intervention program is situated in an appropriate behavior change theory that operationalizes and implements the behavior change process appropriately. Mapping positive mental health factors to the TDF model provided clear guidance and clarity on the mechanism and strategy to cause the desired behavior change in the target group, through the intervention functions generated in the BCT. Thirdly, the modeling process and outcome phase of the MRC's framework created a realistic expectation of the possible outcomes and BCTs for the proposed program within the context of the study. The outcome of the FGDs with community members and simulation exercises with graduate students were instrumental in gathering context-appropriate data, which informed the revision and improvement of the draft content and the practicability of the implementation strategy. The 'feasibility/piloting' phase of the MRC's framework (i.e., testing procedures, estimating recruitment/retention, and determining sample size)

was also directive and instrumental in the initial evaluation of the novel program. Suggestions from expert reviewers were used to refine the implementation strategy and structure of the sessions. Furthermore, the session simulation exercises highlighted potential barriers to implementation and provided useful feedback to generate strategies to overcome them. We observe, from our experience of developing the ILP, that the emphasis on pilot-testing and feasibility testing by the MRC's framework significantly improved the content and materials of the intervention program and its implementation strategies.

The ILP also has a number of theoretical, methodological, and practical strengths. First, we adopted a CBPR approach in formulating the ILP, where we randomly selected participants from the target population for FGDs to appraise and contribute to the proposed program. Second, throughout the development process (i.e., literature review, simulation of sessions, FGDs, and pilot-testing), we made considerable effort to identify cultural norms and values relevant to the content and delivery of the intervention program in order to enhance the cultural sensitivity of the session themes (see Marsiglia & Booth, 2015). The implementation strategy also tried to support interactive participation, with FGDs and pilot sessions held separately for each gender group. The FGDs and content evaluation exercises were instrumental in eliciting practical example situations that relate to, and meet the distinct needs of participants. Third, the formulation of the ILP also took a more global approach by targeting multiple important positive psychology constructs (e.g. meaning in life) and cognitive-behavioral principles (e.g. challenging and replacing negative thoughts with positive thoughts) rather than focus on a single facet of mental health. For instance, beyond teaching participants about the pursuit of meaningful and purposeful life, self-acceptance, and compassion, other sessions focused on teaching participants to cultivate goal-setting and time management skills. Fourth, we structured the program sessions in a manner that prioritizes and encourages participants' interactivity throughout the sessions. Sessions were structured to allow facilitators to lead participants

to review previous sessions and exercises, discuss key concepts and themes, demonstrate skills and exercises, and coach participants to perform skills and complete subsequent exercises. Fifth, to reduce the implementation cost and the challenges of associated with inadequate field experts in sub-Saharan Africa, the ILP intervention program was designed and structured with non-technical vocabularies to be delivered by non-specialist, after appropriate training and supervision.

In terms of methodological approach, our model is similar to previous studies that developed behavior change and health promotion intervention programs in accordance with the MRC framework in Malawi (Masulani-Mwale, Kauye, Gladstone, & Mathanga, 2019), Nigeria (Adewuya et al., 2019), South Africa (Bobrow et al., 2018), and the UK (Milton et al., 2017). By following the Intervention Mapping approach, Borek and colleagues also developed a group-based health promotion intervention to improve health and well-being of parent caregivers of disabled children (Borek et al., 2018). We note, however, that none of these intervention programs were intended for individuals from rural, resource-poor communities.

There were a few challenges with using the MRC's framework to guide the ILP development in the study context. Firstly, the communities selected for this study, and most rural and peri-urban Ghanaian communities, more generally, are patriarchal and collectivistically oriented, with rich cultural and traditional values and norms that exert significant influence on the psychosocial and behavioral expressions of the people (Appiah, 2020; Gyekye, 2013). We note that the processes involved in obtaining informed consent, ensuring protection of privacy and assuring confidentiality, and establishing trusting relationships between researchers and participants take on greater complexity in this context (see Appiah, 2020). Care was taken to explore and adhere to the cultural values and norms in order to encourage participation and safeguard the integrity of the research. Secondly, although a growing number of researchers utilized the MRC framework to develop behavior change and health promotion interventions in other settings, there is a general lack of

research that uses the MRC framework to develop behavior change or health promotion intervention programs in the African context to serve as a model. Research is needed that translates context-relevant theories and research findings into practicable interventions in Africa, using established frameworks.

Thirdly, we were determined to adopt a bottom-up approach in the program development, although the themes and content of the program were determined a priori by the research team. Nonetheless, these were considerably revised with inputs from participants in the FGDs at the appraisal phase, contributions from participants in the session simulation exercise, and participants' feedback from the pilot study. Lastly, although we used available community resources such as meeting venues and furniture in order to reduce the implementation cost, aspects of the intervention development process, such as remuneration of session facilitators and support staff (e.g., independent mediators), field logistics, and session gifts for participants increased the project expenditure substantially.

4.2 Lessons and Implication for Future Research and Practice

A few lessons were learned from applying the MRC complex interventions framework in practice to develop the ILP intervention program. First, we note that the open discussions held among the research team at the various stages of the research process may have contributed to developing a coherent, co-ordinated, and holistic intervention program. The discussions permitted the team to identify and rectify potential challenges at the level of theory selection (i.e., by selecting theory and models that facilitate the promotion of positive mental health) and to select the most appropriate program outcomes and performance objectives (e.g., identification of theoretically based specific BCTs and TDF model) for the program. Second, we observe that the careful selection of our intervention components may have increased its receptivity and potential impacts. We selected constructs and themes that target the promotion of various dimensions of mental health and personal

growth by including topics to promote positive mental health and the development of social skills. Feedback from the FGDs suggests that these themes were also directly related to participants' needs and circumstances. Third, although we had predefined objectives and proposed session components, the iterative process followed to develop the program enabled the team to discuss, evaluate, and refine each proposed theme before they were composed into a single coherent intervention. This is also the case with the findings from the formative phases of the program development stages (i.e., community consultation and content evaluation and the pilot exercise).

Our findings suggest that intervention programs designed to support behaviour change and health promotion in this context need to: (1) involve participants in the program design process in order to increase its relevance and potential impact on the target population; (2) be practical – with sessions structured to fit participants' specific needs, capacities, and circumstances; (3) be structured to task participants to practice lessons and develop skills in-session and at home after demonstrations by facilitators; (4) be delivered by trained facilitators who are native speakers of participants' language and well accustomed to participants' cultural and traditional values and practices; and (5) involve community leaders and trained and well compensated support staff, such as independent mediators, translators, interpreters, or local coordinators.

In future development of similar interventions, researchers should involve members of the target population in the design and implementation process to ensure that the proposed intervention content and materials are relevant to the context and has a potential to positively impact the lives of participants. Prior to the pilot and feasibility exercises, it may also be important for researchers to conduct a simulation exercise of the proposed program with peers. The simulation exercise could guide the researchers to structure the sessions more appropriately, envision the possible questions and duration of the sessions, have the facilitators to master the session materials, and further improve on the content and materials with feedback and observations from the exercise.

Furthermore, considering the influence of cultural values and practices on the psychosocial and behavioral expressions of the Ghanaian people (Appiah, 2020; Gyekye, 2013), there is need for prospective researchers to consult with community leaders and members to acquaint themselves with and adhere to the cultural values and traditional practices of the target group and adhere to them throughout the phases of the research.

5 Conclusions

To our knowledge, this study is the first to formulate an mPPI to promote mental health in a rural Ghanaian adult population by systematically operationalizing and mapping the various activities on the developmental and feasibility/piloting phases of the MRC framework. The methods applied in the development of the ILP and implementation strategy described in this paper, together with the lessons learnt, may be a useful resource for the design of future community-based mental health interventions for the target population The initial pilot exercise, results from the main program evaluation (see Appiah et al., 2020), and findings from the qualitative exploration of participants' experiences and impressions (see Appiah, Wilson Fadiji, Wissing, & Schutte, 2021) of the ILP intervention program suggest that a group-based mPPI developed using the CBPR approach and delivered by trained lay facilitators has a realistic chance of improving mental health and reducing symptoms of depression and negative affect in the target group. It is our hope that this on-the-field experience of applying the MRC's framework in this context would guide future researchers seeking to develop similar interventions to envision potential challenges associated with intervention development process in the rural context of Ghana and sub-Saharan Africa, more generally.

We find that a key component for developing community-based mental health interventions in the context of this study is the formative phase – where theories, outcomes of literature review, and stakeholders' feedback are integrated, adapted, or tailored to the specific needs and cultural framework of the target population. It is also important to carefully consider and utilize

available resources from the target community, such as meeting venues and furnishers, to minimize the implementation cost of the program. Our experience also revealed that it is possible to use non-specialist mental health personnel to deliver community-based mental health promotion interventions, with appropriate training and supervision. We recommend that the development of community-based mPPIs should include focus group formative research to understand and appraise local priorities, as well as empirical research to test the study protocol and methods prior to implementation. It is also important that the measures used to evaluate the effectiveness of these programs are adapted and validated in the study context before they are administered, given the sociocultural differences between contexts and their implications on conceptualization and expression of mental health (see Appiah, Schutte, Wilson Fadiji, Wissing, & Cromhout, 2020).

Declarations

Ethics approval and consent to participate. The study was approved by the Health Research Ethics Committee of the North-West University (NWU-00109-17-S1), South Africa, and the Noguchi Memorial Institute for Medical Research Institutional Review Board of the University of Ghana (NMIMR.IRB CPN 007/17-18), Ghana. Permissions were also sought from the Regional and District Health Directorates of the Sunyani West District as well as from the chiefs and community leaders of the communities involved for permission to conduct the study.

Competing interests. The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Author Contributions. RA, AWF, MPW, and LS conceived and designed the study. RA led the recruitment and training of field staff, wrote the initial draft of the ILP, and supervised all the steps in the development of the ILP intervention program, with AWF, MPW, and LS supervising the process and making inputs. RA supervised the

implementation of the pilot study, the collection, and analysis of the data. RA drafted the manuscript, with AWF, LS, and MPW making inputs at all steps of the manuscript's development which were then incorporated into the text by RA. The study forms part of the doctoral thesis of the first author.

Acknowledgements. The authors remain thankful to all participants, research assistants, chiefs and elders of the communities, and graduate students involved in this study. We are particularly grateful to Professor Angela Ofori-Atta, Dr. Christelle Liversage, and Dr. Joana Salifu Yendork for their assistance with the review of the ILP intervention program manual. The first author is thankful to the National Institute for the Humanities and Social Sciences (South Africa) for the award of the African Pathways NIHSS-CODESRIA Doctoral Scholarship towards his doctoral studies at the North-West University. The scholarship source did not have any influence on the design of the study, data collection, and analysis or writing of the manuscript. The first author is also grateful to the North-West University for the Doctoral and International Students' bursaries received during the period of his studentship.

References

Addai, I., Opoku-Agyeman, C., & Amanfu, S. K. (2014). Exploring predictors of subjective well-being in Ghana: A micro-level study. *Journal of Happiness Studies*, *15*(4), 869-890. https://doi.org/10.1007/s10902-013-9454-7

Adewuya, A. O., Adewumi, T., Momodu, O., Olibamoyo, O., Adesoji, O., Adegbokun, A., Adeyemo, S., Manuwa, O., & Adegbaju, D. (2019). Development and feasibility assessment of a collaborative stepped care intervention for management of depression in the mental health in primary care (MeHPriC) project, Lagos, Nigeria. *Psychological medicine, 49*(13), 2149–2157.

Appiah, R (2020). Community-based participatory research in rural African contexts: Ethico-cultural considerations and lessons from Ghana. *Public Health Reviews, 41*, 27. https://doi.org/10.1186/s40985-020-00145-2

Appiah, R., Schutte, L., Wilson Fadiji, A., Wissing, M. P., & Cromhout, A. (2020). Factorial validity

of the Twi versions of five measures of mental health and well-being in Ghana. *PloS one, 15*(8), e0236707. https://doi.org/10.1371/journal.pone.0236707

Appiah, R., Wilson Fadiji, A., Wissing, M. P., & Schutte, L. (2021). Participants' experiences and impressions of a group-based positive psychology intervention programme for rural adults in Ghana. *International journal of qualitative studies on health and well-being, 16*(1), 1891760. https://doi.org/10.1080/17482631.2021.1891760

Appiah, R., Wilson-Fadiji, A., Schutte, L., & Wissing, M. P. (2020). Effects of a community-based multicomponent positive psychology intervention on mental health of rural adults in Ghana. *Applied psychology: Health and Well-Being*, 10.1111/aphw.12212.

Arku, F. S., Filson, G. C., & Shute, J. (2008). An empirical approach to the study of well-being among rural men and women in Ghana. *Social Indicators Research*, *88*(2), 365-387. https://doi.org/10.1007/s11205-007-9197-0

Bannink, F. P. (2014). Positive CBT: From reducing distress to building success. *Journal of contemporary psychotherapy*, *44*(1), 1-8. https://doi.org/10.1007/s10879-013-9239-7

Beck, A. T. (1991). *Cognitive therapy and the emotional disorders*. Penguin.

Beck, J. S. (2011). *Cognitive behavior therapy: Basics and beyond* . New York, NY.

Bhutta, Z. A., Sommerfeld, J., Lassi, Z. S., Salam, R. A., & Das, J. K. (2014). Global burden, distribution, and interventions for infectious diseases of poverty. *Infectious Diseases of Poverty*, *3*(1), 21. doi: 10.1186/2049-9957-3-21

Bleijenberg, N., de Man-van Ginkel, J. M., Trappenburg, J. C., Ettema, R. G. J., Sino, C. J., Heim, N., …,& Schuurmans, M. J. (2018). Increasing value and reducing waste by optimizing the development of complex interventions: Enriching the development phase of the Medical Research Council (MRC) Framework. *International Journal of Nursing Studies, 79,* 86– 93.

Bobrow, K., Farmer, A., Cishe, N., Nwagi, N., Namane, M., Brennan, T. P., Springer, D., Tarassenko, L., & Levitt, N. (2018). Using the Medical Research Council framework for development and evaluation of complex interventions in a low resource setting to develop a theory-based treatment support intervention delivered via SMS text message to improve blood pressure control. BMC health services research, 18(1), 33. https://doi.org/10.1186/s12913-017-2808-9

Bonthuys, A., Botha, K. F., Nienaber, A. W., Freeks, F. E., & Kruger, A. (2011). The effect of the Lifeplan Programme on the psychological wellbeing of a rural community in South Africa. *Journal of Psychology in Africa, 21* (3), 421-428.

Borek, A. J., Abraham, C., Smith, J. R., Greaves, C. J., & Tarrant, M. (2015). A checklist to improve reporting of group-based behaviour-change interventions. BMC Public Health, 15(1), 963. doi:10.1186/s12889-015-2300-6

Borek, A. J., McDonald, B., Fredlund, M., Bjornstad, G., Logan, S., & Morris, C. (2018). Healthy Parent Carers programme: development and feasibility of a novel group-based health-promotion intervention. BMC public health, 18(1), 270. https://doi.org/10.1186/s12889-018-5168-4

Botvin, G. J., & Griffin, K. W. (2015). Life Skills Training: A competence enhancement approach to tobacco, alcohol, and drug abuse prevention. *Handbook of adolescent drug use prevention: Research, intervention strategies, and practice*, 177-196.

Cane, J., Richardson, M., Johnston, M., Ladha, R., & Michie, S. (2015). From lists of behaviour change techniques (BCTs) to structured hierarchies: comparison of two methods of developing a hierarchy of BCTs. *British journal of health psychology, 20*(1), 130–150.

Carr, A., Finnegan, L., Griffin, E., Cotter, P., & Hyland, A. (2017). A randomized controlled trial of the say yes to life (SYTL) positive psychology group psychotherapy program for depression: An interim report. *Journal of Contemporary Psychotherapy*, *47*(3), 153-161. https://doi.org/10.1007/s10879-016-9343-6

Chakhssi, F., Kraiss, J. T., Sommers-Spijkerman, M., & Bohlmeijer, E. T. (2018). The effect of positive psychology interventions on well-being and distress in clinical samples with psychiatric or somatic disorders: A systematic review and meta-analysis. *BMC Psychiatry*, *18*(1), 211. https://doi.org/10.1186/s12888-018-1739-2

Chandler, C. I., Meta, J., Ponzo, C., Nasuwa, F., Kessy, J., Mbakilwa, H., Haaland, A., & Reyburn, H. (2014). The development of effective behaviour change interventions to support the use of malaria rapid diagnostic tests by Tanzanian clinicians. *Implementation science: IS, 9,* 83. https://doi.org/10.1186/1748-5908-9-83

Chandler, J., Rycroft-Malone, J., Hawkes, C., & Noyes, J. (2016). Application of simplified Complexity Theory concepts for healthcare social systems to explain the implementation of evidence into practice. *Journal of Advanced Nursing*, *72*(2), 461-480. doi: 10.1111/jan.12815.

Chiumento, A., Hamdani, S. U., Khan, M. N., Dawson, K., Bryant, R. A., Sijbrandij, M., ... & Van Ommeren, M. (2017). Evaluating effectiveness and cost-effectiveness of a group psychological intervention using cognitive behavioural strategies for women with common mental disorders in conflict-affected rural Pakistan: study protocol for a randomised controlled trial. *Trials*, *18*(1), 190. doi: 10.1186/s13063-017-1905-8.

Clark, L. A., Cuthbert, B., Lewis-Fernández, R., Narrow, W. E., & Reed, G. M. (2017). Three approaches to understanding and classifying mental disorder: ICD-11, DSM-5, and the National Institute of Mental Health's Research Domain Criteria (RDoC). *Psychological Science in the Public Interest*, *18*(2), 72-145. doi: 10.1177/1529100617727266.

Connell, L. A., McMahon, N. E., Redfern, J., Watkins, C. L., & Eng, J. J. (2015). Development of a

behaviour change intervention to increase upper limb exercise in stroke rehabilitation. *Implementation science : IS*, 10, 34. https://doi.org/10.1186/s13012-015-0223-3

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2013). Developing and evaluating complex interventions: the new Medical Research Council guidance. *International journal of nursing studies, 50*(5), 587–592. https://doi.org/10.1016/j.ijnurstu.2012.09.010

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., Petticrew, M., & Medical Research Council Guidance (2008). Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ (Clinical research ed.), 337*, a1655. https://doi.org/10.1136/bmj.a1655

Curry, O. S., Rowland, L. A., Van Lissa, C. J., Zlotowitz, S., McAlaney, J., & Whitehouse, H. (2018). Happy to help? A systematic review and meta-analysis of the effects of performing acts of kindness on the well-being of the actor. *Journal of Experimental Social Psychology, 76,* 320-329.

Damreihani, N., Behzadipour, S., Haghpanh, S., & Bordbar, M. (2018). The effectiveness of positive psychology intervention on the well-being, meaning, and life satisfaction of mothers of children with cancer: A brief report. *Journal of Psychosocial Oncology*, *36*(3), 382-388. doi: 10.1080/07347332.2018.1427173.

De Silva, M. J., Breuer, E., Lee, L., Asher, L., Chowdhary, N., Lund, C., & Patel, V. (2014). Theory of change: A theory-driven approach to enhance the Medical Research Councils' framework for complex interventions. *Trials, 15*(1), a1655

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*, 71-75.

Eagleson, C., Hayes, S., Mathews, A., Perman, G., & Hirsch, C. R. (2016). The power of positive thinking: Pathological worry is reduced by thought replacement in Generalized Anxiety Disorder. *Behaviour Research and Therapy, 78,* 13–18. https://doi.org/10.1016/j.brat.2015.12.017

English M. (2013). Designing a theory-informed, contextually appropriate intervention strategy to improve delivery of paediatric services in Kenyan hospitals. *Implementation science : IS, 8,* 39.

French, S. D., Green, S. E., O'Connor, D. A., McKenzie, J. E., Francis, J. J., Michie, S., … Grimshaw, J. M. (2012). Developing theory-informed behaviour change interventions to implement evidence into practice: A systematic approach using the theoretical domains framework. *Implementation Science, 7,* 38. doi:10.1186/1748-5908-7-38

Friedman, E. M., Ruini, C., Foy, R., Jaros, L., Sampson, H., & Ryff, C. D. (2017). Lighten UP! A community-based group intervention to promote psychological well-being in older adults. *Aging & Mental Health*, *21*(2), 199-205. doi: 10.1080/13607863.2015.1093605

Garoff, F., Kangaslampi, S., & Peltonen, K. (2019). Development and implementation of a group based mental health intervention for unaccompanied minors. *Scandinavian Journal of Psychology*, *60*(1), 7-15. doi: 10.1111/sjop.12497

Ghana's District League Table (2016). Strengthening Social Accountability to the Nation's Progress. Retrieved from https://www.unicef.org/ghana/District_League_Table_REPORT_FINAL_for_web_Dec_2016.pdf

Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF International (2015). *Ghana Demographic and Health Survey 2014*. Rockville, Maryland, USA: GSS, GHS, and ICF International.

Glozah, F. N. (2015). Exploring Ghanaian adolescents' meaning of health and wellbeing: A psychosocial perspective. *International journal of Qualitative Studies on Health and Well-being*, *10*(1), 26370. doi: 10.3402/qhw.v10.26370

Gyekye, K.(2013*). Philosophy culture and vision: African perspectives: Selected essays*. Accra, Ghana: Sub-Saharan Publishers.

Haggerty, R. J., & Mrazek, P. J. (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research*. National Academies Press.

Hendriks, T., Schotanus-Dijkstra, M., Hassankhan, A., Sardjo, W., Graafsma, T., Bohlmeijer, E., & de Jong, J. (2019). Resilience and well-being in the Caribbean: Findings from a randomized controlled trial of a culturally adapted multi-component positive psychology intervention. *The Journal of Positive Psychology*, 1-16. doi: 10.1080/17439760.2019.1590624

Ho, H. C., Yeung, D. Y., & Kwok, S. Y. (2014). Development and evaluation of the positive psychology intervention for older adults. *The Journal of Positive Psychology*, *9*(3), 187-197. doi: 10.1080/17439760.2014.888577

Hoddinott, P., Allan, K., Avenell, A., & Britten, J. (2010). Group interventions to improve health outcomes: a framework for their design and delivery. *BMC Public Health*, *10*(1), 800. doi: 10.1186/1471-2458-10-800.

Hodges, S. D., Clark, B., & Myers, M. W. (2011). Better living through perspective taking. In R. Biswas-Diener (Ed.), *Positive psychology as a mechanism for social change* (pp. 193-218). Dordrecht, Netherlands: Springer Press.

Hoffmann, T. C., Glasziou, P. P., Boutron, I., Milne, R., Perera, R., Moher, D.,…, & Michie, S. (2014). Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *British Medical Journal, 348*, g1687.

Hofmann, S. G., Asnaani, A., Vonk, I. J., Sawyer, A. T., & Fang, A. (2012). The efficacy of cognitive

behavioral therapy: A review of meta-analyses. *Cognitive Therapy and Research*, *36*(5), 427-440. doi: 10.1007/s10608-012-9476-1

Huffman, J. C., Mastromauro, C. A., Boehm, J. K., Seabrook, R., Fricchione, G. L., Denninger, J. W., & Lyubomirsky, S. (2011). Development of a positive psychology intervention for patients with acute cardiovascular disease. *Heart international, 6*(2), e14. https://doi.org/10.4081/hi.2011.e14

Jaser, S. S., Patel, N., Linsky, R., & Whittemore, R. (2014). Development of a positive psychology intervention to improve adherence in adolescents with type 1 diabetes. *Journal of pediatric health care : official publication of National Association of Pediatric Nurse Associates & Practitioners, 28*(6), 478–485. https://doi.org/10.1016/j.pedhc.2014.02.008

Kelly, B. J., Lewin, T. J., Stain, H. J., Coleman, C., Fitzgerald, M., Perkins, D., ... & Beard, J. R. (2011). Determinants of mental health and well-being within rural and remote communities. *Social Psychiatry and Psychiatric Epidemiology*, *46*(12), 1331-1342. doi: 10.1007/s00127-010-0305-0.

Keyes, C. L. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, 207-222. doi: 10.2307/3090197.

Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, *73*(3), 539. doi:10.1037/0022-006X.73.3.539

Keyes, C. L. (2007). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *American Psychologist*, *62*(2), 95. doi: 10.1037/0003-066X.62.2.95

Keyes, C. L., Dhingra, S. S., & Simoes, E. J. (2010). Change in level of positive mental health as a predictor of future risk of mental illness. *American Journal of Public Health*, *100*(12), 2366-2371. doi: 10.2105/AJPH.2010.192245

Kobau, R., Seligman, M. E., Peterson, C., Diener, E., Zack, M. M., Chapman, D., & Thompson, W. (2011). Mental health promotion in public health: Perspectives and strategies from positive psychology. *American Journal of Public Health*, *101*(8), e1-e9. doi: 10.2105/AJPH.2010.300083

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a Brief Depression Severity Measure. *Journal of General Internal Medicine, 16*(9), 606–613.

Lewis, M. L., Scott, D. L., & Calfee, C. (2013). Rural social service disparities and creative social work solutions for rural families across the life span. *Journal of Family Social Work*, *16*(1), 101-115. doi: 10.1080/10522158.2012.747118

Lomas, T., & Ivtzan, I. (2016). Second wave positive psychology: Exploring the positive–negative dialectics of wellbeing. *Journal of Happiness Studies*, *17*(4), 1753-1768.

https://doi.org/10.1007/s10902-015-9668-y

Luijten, C. C., Kuppens, S., van de Bongardt, D., & Nieboer, A. P. (2019). Evaluating the psychometric properties of the Mental Health Continuum-Short Form (MHC-SF) in Dutch adolescents. *Health and Quality of Life Outcomes, 17*, 157. https://doi.org/10.1186/s12955-019-1221-y

Lund, C., De Silva, M., Plagerson, S., Cooper, S., Chisholm, D., Das, J., ... & Patel, V. (2011). Poverty and mental disorders: breaking the cycle in low-income and middle-income countries. *The Lancet*, *378*(9801), 1502-1514. https://doi.org/10.1016/S0140-6736(11)60754-X

Maini, R., Mounier-Jack, S., & Borghi, J. (2018). How to and how not to develop a theory of change to evaluate a complex intervention: reflections on an experience in the Democratic Republic of Congo. *BMJ Global Health*, *3*(1), e000617. doi: 10.1136/bmjgh-2017-000617

Marrero, R. J., Carballeira, M., Martin, S., Mejias, M., & Hernández, J. A. (2016). Effectiveness of a positive psychology intervention combined with cognitive behavioural therapy in university students. *Anales de Psicología/Annals of Psychology*, *32*(3), 728-740. https://doi.org/10.6018/analesps.32.3.261661

Martela, F., & Steger, M. F. (2016). The three meanings of meaning in life: Distinguishing coherence, purpose, and significance. *The Journal of Positive Psychology*, *11*(5), 531–545. https://doi.org/10.1080/17439760.2015.1137623

Marsiglia, F. F., & Booth, J. M. (2015). Cultural adaptation of interventions in real practice settings. *Research on social work practice, 25*(4), 423–432. https://doi.org/10.1177/1049731514535989

Michie, S., Johnston, M., Abraham, C., Lawton, R., Parker, D., & Walker, A. (2005). Making psychological theory useful for implementing evidence based practice: A consensus approach. *Quality & Safety in Health Care, 14,* 26– 33.

Michie, S., Johnston, M., Francis, J., Hardeman, W., & Eccles, M. (2008). From theory to intervention: mapping theoretically derived behavioural determinants to behaviour change techniques. *Applied Psychology, 57* (4), 660-680. 10.1111/j.1464-0597.2008.00341.x.

Michie, S., Yardley, L., West, R., Patrick, K., & Greaves, F. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care: recommendations resulting from an international workshop. *Journal of Medical Internet Research*, *19*(6), e232. doi: 10.2196/jmir.7126.

Milton, A., Lloyd-Evans, B., Fullarton, K., Morant, N., Paterson, B., Hindle, D., Kelly, K., Mason, O., Lambert, M., & Johnson, S. (2017). Development of a peer-supported, self-management intervention for people following mental health crisis. BMC research notes, 10(1), 588. https://doi.org/10.1186/s13104-017-2900-6

Moore, G. F., Audrey, S., Barker, M. (2015). Process evaluation of complex interventions: Medical Research Council guidance. *British Medical Journal, 350*, h1258.

Murphy, M. E., Byrne, M., Zarabzadeh, A., Corrigan, D., Fahey, T., & Smith, S. M. (2017). Development of a complex intervention to promote appropriate prescribing and medication intensification in poorly controlled type 2 diabetes mellitus in Irish general practice. *Implementation science : IS, 12*(1), 115. https://doi.org/10.1186/s13012-017-0647-z

Musich, S., Wang, S. S., Kraemer, S., Hawkins, K., & Wicker, E. (2018). Purpose in life and positive health outcomes among older adults. *Population Health Management*, *21*(2), 139-147. doi: 10.1089/pop.2017.0063

Ohrnberger, J., Fichera, E., & Sutton, M. (2017). The relationship between physical and mental health: a mediation analysis. *Social Science & Medicine*, *195*, 42-49. doi: 10.1016/j.socscimed.2017.11.008.

Page, K. M., & Vella-Brodrick, D. A. (2013). The working for wellness program: RCT of an employee well-being intervention. *Journal of Happiness Studies*, *14*(3), 1007-1031. https://doi.org/10.1007/s10902-012-9366-y

Rashid, T. (2015). Positive psychotherapy: A strength-based approach. *The Journal of Positive Psychology*, *10*(1), 25-40. http://dx.doi.org/10.1080/17439760.2014.920411

Rugira, J., Nienaber, A. W., & Wissing, M. P. (2015). Evaluating the effect of a psychosocial well-being programme for students at a Tanzanian university. *African Journal for the Psychological Study of Social Issues, 18,* 77-98.

Ruini, C., & Ryff, C. D. (2016). Using eudaimonic well-being to improve lives. In A. M. Wood & J. Johnson (Eds.), *The Wiley handbook of positive clinical psychology* (p. 153–166). Wiley-Blackwell

Ryff, C. D. (2014). Psychological well-being revisited: Advances in the science and practice of eudaimonia. *Psychotherapy and Psychosomatics*, *83*(1), 10-28. doi: 10.1159/000353263

Ryff, C. D. (2017). Eudaimonic well-being, inequality, and health: Recent findings and future directions. *International Review of Economics*, *64*(2), 159-178. doi: 10.1007/s12232-017-0277-4

Schotanus-Dijkstra, M., Pieterse, M. E., Drossaert, C. H., Walburg, J. A., & Bohlmeijer, E. T. (2019). Possible mechanisms in a multicomponent email guided positive psychology intervention to improve mental well-being, anxiety and depression: A multiple mediation model. *The Journal of Positive Psychology*, *14*(2), 141-155. doi: 10.1080/17439760.2017.1388430

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). Windsor, UK: NFER-NELSON.

Sigelman, C. K., & Rider, E. A. (2014). *Life-span Human Development*. Cengage Learning.

Van Zyl, L. E., & Rothmann, S. (2012). Beyond smiling: The evaluation of a positive psychological intervention aimed at student happiness. *Journal of Psychology in Africa, 22*(3), 369-384.

Watt, M. H., Wilson, S. M., Sikkema, K. J., Velloza, J., Mosha, M. V., Masenga, G. G., … & Nyindo, P. M. (2015). Development of an intervention to improve mental health for obstetric fistula patients in Tanzania. *Evaluation and program planning, 50,* 1–9.

Weiss, L. A., Westerhof, G. J., & Bohlmeijer, E. T. (2016). Can we increase psychological well-being? The effects of interventions on psychological well-being: A meta-analysis of randomized controlled trials. *PloS One*, *11*(6), e0158092. doi: 10.1371/journal.pone.0158092

White, C. A., Uttl, B., & Holder, M. D. (2019). Meta-analyses of positive psychology interventions: The effects are much smaller than previously reported. *PloS One, 14*(5), e0216588. https://doi.org/10.1371/journal.pone.0216588

Wight, D., Wimbush, E., Jepson, R., & Doi, L. (2016). Six steps in quality intervention development (6SQuID). *Journal of epidemiology and community health, 70*(5), 520–525. https://doi.org/10.1136/jech-2015-205952

Wong, P. T. (2011). Positive psychology 2.0: Towards a balanced interactive model of the good life. *Canadian Psychology/Psychologie Canadienne*, *52*(2), 69. http://dx.doi.org/10.1037/a0022511

World Health Organization. (2018). *Mental Health Atlas 2017.* Geneva, (No. CC BY-NC-SA 3.0 IGO). World Health Organization.