Step-by-Step: a new WHO digital mental health intervention for depression

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Abstract: The World Health Organization is developing a range of interventions, including technology supported interventions, to help address the mental health treatment gap, particularly in low and middle-income countries. One of these, Step-by-Step, is a guided, technology supported, intervention for depression. It provides psychoeducation and training in behavioural activation through an illustrated narrative with additional therapeutic techniques such as stress management (slow breathing), identifying strengths, positive self-talk, increasing social support and relapse prevention. Step-by-Step has been designed so that it can be adapted for use in settings with different cultural contexts and resource availability and to be meaningful in communities affected by adversity. This paper describes the process of developing Step-by-Step and highlights particular design features aimed at increasing feasibility of implementation in a wide variety of settings.

Keywords: Mental health; digital divide; telemedicine; developing countries; psychological techniques

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Introduction

The increasing availability of smartphones in low and middle-income countries provides an opportunity for addressing the mental health treatment gap which can be as high as 75% but can vary by disorder and region (1). Evidence for online psychological interventions from high income countries has shown that they are effective for depression and anxiety and may show equal benefit to face to face cognitive behavioural therapy (CBT) interventions if they are guided (1,2). Guidance may be limited (e.g., briefly reviewing completion of activities) and can be effective when provided by non-specialists with supervision (3). World Health Organization (WHO) guidelines recommend the use of self-help psychological interventions for depression and non-specialist delivery of interventions more generally (4). Although online interventions may provide a further option for delivery of services where resources are scarce (5), research on the effectiveness of online interventions in low- and middle-income countries is limited (6).

As part of recent work to publish a range of potentially scalable psychological intervention manuals (7), WHO is developing several technology supported psychological interventions for a range of user groups. These interventions aim to be flexible to meet the needs of groups affected by a wide range of adversities including potentially traumatic events and ongoing severe and chronic problems, such as poverty. These technology supported psychological interventions provide potential for greater coverage, particularly in hard to reach, remote or insecure places (e.g., conflict zones) or for individuals who face other barriers or do not wish to access publicly visible services because of stigma. Such interventions may use delivery methods such as pre-recorded self-help provided to a group [e.g., WHO's

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Self Help Plus intervention) (8)], or minimally guided self-help delivered through a website or a mobile app such as the intervention described in this paper.

This paper describes "Step-by-Step"—an online minimally guided self-help intervention—and outlines the process of development with regards to four core aspects: Theoretical background, content, guidance model and delivery system. It focuses particularly on elements of the intervention that may make Step-by-Step more suitable for adaptation for use in a range of countries.

Theoretical background of Step-by-Step

Step-by-Step was initially conceptualised as an online self-help version of WHO's Problem Management Plus (PM+). PM+ is a transdiagnostic psychological intervention for common mental health problems comprising of core strategies of stress management, behavioural activation, problem management and increasing social support, which are delivered over five, 90-minute sessions, to groups or individuals (9).

Anecdotal reports from teams implementing PM+ in randomised controlled trials suggested that the problem management strategy needed comparatively more support from facilitators, including in some cases, providing suggestions for ways to address problems. On the basis of this information and feedback from reviews of an earlier version of Step-by-Step, problem management was removed due to concerns this would be a difficult skill to provide via technology, with or without support, to individuals in low and middle-income countries.

The intervention was therefore adapted to focus on depression with behavioural activation as the central therapeutic component with additional components covering psychoeducation, stress management techniques (slow breathing), identifying strengths, positive self-talk, increasing social support and relapse prevention. Behavioural activation was chosen as the central technique as this has been shown to be a highly effective and simple way to address depressive symptoms (10). The additional strategies were included partly to support behavioural activation (e.g., social support as a form of behavioural activation, slow breathing to help overcome anxiety when completing a more challenging activity). While Step-by-Step is mainly based on behavioural activation, the intervention is designed to be flexible enough to allow for additional techniques to be added in the future to make it transdiagnostic (e.g. by adding an exposure or cognitive-restructuring module).

Basing interventions on psychological theory and involving end users in the design process have been proposed as important aspects of intervention development (11). Possible end users of Step-by-Step include individual beneficiaries using the product, as well as governments and agencies that may implement the package once released. The needs of these groups were considered in the design process through consultations with key stakeholders and experts as well as qualitative work with populations in Lebanon (the site of the first pilot) (results to be published in a forthcoming paper). These consultations provided important information which informed the development of the content (e.g., easy adaptation of content), the guidance model (e.g., telephone or email support) and the delivery system (e.g., app or website). Important considerations are explained below in more detail.

Step-by-Step content overview

Existing technology supported interventions use different methods to convey therapeutic information. For example, illustrated content is used in "This Way Up" (https://thiswayup.org.au) and "Deprexis" (https://deprexis.com), while "Moodgym" (https://moodgym.com.au) uses written text accompanied with interactive activities (e.g., activity planning using an online tool). The content for Step-by-Step is delivered over 5 sessions using a hybrid of these two models with an illustrated narrative story (around 50 slides per session) providing most of the information and an interactive component where users practice the skills they are learning (e.g., activity scheduling). An illustrated story told by an individual experiencing depression, was chosen as the format for delivery as it has previously been shown to be an effective medium for online interventions (12) and can be further adapted by adding audio recordings of the text for areas where literacy may be a problem. A generic English version of the content was created and then subsequently adapted for the first pilot test in Lebanon. Results and lessons learned from the pilot will be published in a forthcoming paper.

The Step-by-Step narrative is based on a character who visits a health worker for help with depression, it is told by the main character with the health worker providing instruction on the therapeutic techniques (*Figure 1*). Depending on the setting, this may be modified to another trusted figure, e.g., community elder. Each session lasts for around 30 minutes and is split into two parts each of

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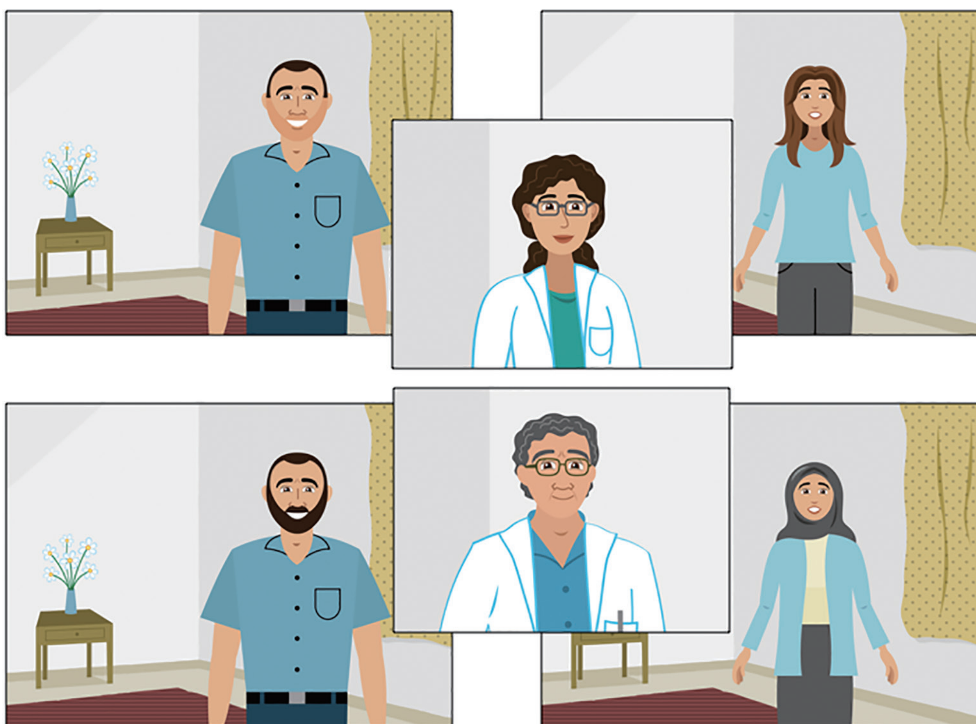

Figure 1 Character options for Step-by-Step (Lebanon version).

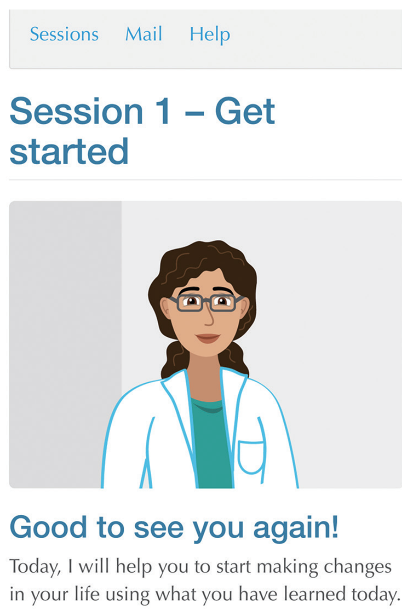

Figure 2 Coaching to complete activities.

approximately 15 minutes. In the first part, the character relays their story, including the skills they learnt from the health professional and their attempts to apply them in their own life. During the interactive part of the session, the health professional character teaches in more detail the core therapeutic component for that session and coaches the user to complete activities for the week using interactive online activities (*Figure 2*).

The health care professional as the trusted figure was introduced as the Ministry of Public Health in Lebanon and other key stakeholders advised that people would want health information to come from a trusted source, preferably a doctor character. No literature could be found which addresses the status of a doctor within Lebanon to support this decision, but initial user testing of the intervention suggested this character was acceptable, with some further changes made to the appearance of the character in response to feedback from users. The health professional character also provides a narrative device by which to deliver baseline and session by session questionnaires.

Step-by-Step starts with an assessment called "Your Strengths" which includes questionnaires covering mood, functioning and identified problems. A brief exercise to identify individual strengths was also included to provide the user with some form of support from the start of the intervention. Identifying strengths has been proposed as an

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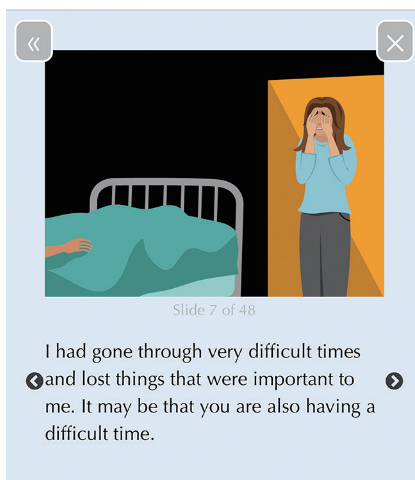

Figure 3 Ensuring relevance of the central Step-by-Step narrative to many groups.

approach for building resilience in cognitive behavioural therapy (13) and this technique appeared to fit well as a brief and simple exercise to provide support early on in the programme. In addition, it was thought this could potentially provide greater encouragement to users to return for later sessions than if the first session was an assessment only. This exercise was used in user testing and there no concerns were raised by participants. The five therapeutic sessions are: "Get started" (psychoeducation and trying small and pleasant activities), "Get active" (behavioural activation) "Beat obstacles" (more complex behavioural activation with strategies to overcome difficulties such as stress management as a means to combat anxiety about carrying out activities), "Get together" (increasing social support) and "Keep it up" (relapse prevention).

Regarding design considerations, the intervention was designed to maximize accessibility across different socio-economic and education groups. The text of the story is easy to read to aid understanding. Narrated videos of the illustrated texts are available to improve access for people with low literacy. File size for the content was kept as low as possible to facilitate use in areas where internet access may be expensive, or where bandwidth is restricted or unreliable.

Tailoring content of interventions to users has been suggested as a design feature of more effective technology supported interventions (14). The story text and images of Step-by-Step were devised to provide some tailoring towards characteristics of the individual (e.g., gender), whilst allowing for wide use within a community by not being overly specific. Minor adaptations can be made to the central storyline to ensure it is suitable for women or men or younger or older age groups. Illustrations are digital which means features or clothing can be easily changed, which should reduce the resources required for illustration adaptation.

In the case of Lebanon, Step-by-Step was tailored to the users' gender and to very broad cultural aspects. It was adapted to have four versions of the main character with users selecting the one they preferred. For women, two options were presented, a woman (called Zeina) with headscarf and without (*Figure 1*), for men, the two options included a character (called Karim) with a beard and without (*Figure 1*). These characters were tested firstly with staff at the Ministry of Public Health and later with community members during the adaptation phase (results to be published in a forthcoming paper).

Another consideration to increase relevance for different populations was ensuring the story and images were not too specific to one group or event. The Lebanese adaptation of Step-by-Step had to be relevant for major cultural groups living in the country (e.g., Syrians, Lebanese and Palestinians), thus focusing on experiences of conflict, for example witnessing a bombing, may increase relevance for one group while reducing relevance for another. To address this the story does not focus on specific events or detailed descriptions of experiences, but instead describes adversity and difficult life events using images that depict or suggest common adversities such as illness and death. The image in *Figure 3* demonstrates this, as it reflects the experience of loss or illness without defining the cause. This may make the image relatable to a wider group of people, as it allows for an individual to speculate on the cause and may thereby increase relevance, as opposed to an image which confirms a cause (e.g., conflict) that may not be so relatable to an individual's own situation. This is an example of a design decision to ensure as wide as possible applicability and to reduce the number of versions required for each setting.

The Step-by-Step content was designed with a view to compatibility across implementation and delivery systems. Therefore, informational (narrative story) and interactive exercises (such as activity scheduling) can conceivably be delivered through many mediums such as a self-help book, website, app or video to fit the needs of a country or context, as long as the core components of the narrative story and interactive activities remain constant.

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Guidance model for Step-by-Step

Guidance in Step-by-Step is provided by non-professional "e-helpers" and is limited to 15–20 minutes per week using telephone, synchronous online messaging or through a secure email system. Multiple contact approaches are provided to ensure users have choice and can use a method that suits their needs. E-helpers are university graduates without a professional qualification in mental health care, but with some experience of providing support to vulnerable people (e.g., volunteering, working in a community service). They are trained to provide structured guidance which covers a review of the previous session and any related questions, review of the user's experience putting the skills into practice and providing encouragement and support in using the program. Initial training is brief (an initial six days for the Lebanon pilot) and ongoing managerial and clinical case supervision is provided by qualified staff (e.g., a clinical psychologist). E-helpers are trained to use basic helping skills, like active listening and basic problem management for other issues that might be mentioned by users, for example orientating the person towards other sources of support or help in their community. E-helpers are also trained to identify, assess, manage and report risk, adverse or serious adverse events encountered during the support sessions to the clinical supervisor.

As the content was purposefully designed to be independent of the guidance model, Step-by-Step can potentially be provided using contact on request (ad hoc guidance) or without any guidance, which may be more suited in certain contexts or for those who prefer not to have contact with a person. As a guided self-help intervention, Step-by-Step is flexible enough to fit into multiple types of health and social care systems and adaptable to different settings and resource availability.

Delivery system for Step-by-Step

The initial version of Step-by-Step is a responsive website that automatically resizes for use on mobile devices. A website was first developed as this was deemed a simpler approach for a first version than an app for use in an initial pilot. Importantly, given the increasing use of mobile devices globally, it was essential for the intervention to be designed for use on mobile devices.

The client user area of the website comprises of: (I) welcome page; (II) registration process and baseline data collection; (III) a "home" area where each session is displayed, along with an area for reviewing past exercises and inputs. In addition to the client user area, a clinical dashboard for e-helpers and supervisors provides details of client progress, including weekly scores on psychological distress measures and an overview of sessions completed. This section is used to securely record information.

A smartphone app and updated web version of Step-by-Step is under development, which will include further refinements to usability and presentation of the core content. This will bring improvements to the ability to deploy Step-by-Step in areas where internet coverage is poor or expensive, as a Wi-Fi connection can be used to download the app which can then be used without an active connection.

Adapting and using Step-by-Step in other countries and settings

The features of Step-by-Step reported above make it possible to adapt it for other cultures or settings. Research suggests that psychological interventions are likely more effective if they have been adapted for different contexts, for example language, content, local idioms and metaphors (15). Adaptation of Step-by-Step would involve formative research to ensure the storyline and illustrations of Step-by-Step are suitably adapted for different communities. Quite possibly the helper in the story will not be a doctor in a range of countries. The use of digital illustrations may further aid adaptation by allowing changes to only key features of illustrations.

Step-by-Step is designed to be implemented by a government or organization providing coverage to a large population. Adaptations to the story and illustrations, informed by qualitative data gathered from users, have to be made with the support of an illustrator and programmer, with support to implement and manage the online platform. It has been designed as a global public good which WHO will release on the basis of positive results from randomised controlled trials. The flexibility of Step-by-Step means that it can be delivered in many different ways depending on the context.

In upcoming trials, it will be tested both with minimal weekly guidance and in separate trials using contact on request. The trials will use a smartphone app and web version. Once efficacy has been demonstrated, it can then be further researched or implemented in different ways, for example, a healthcare worker could potentially use the story to guide face to face sessions, or different cadres of

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individuals could be trained to provide remote or face to face support. The conceptualisation of content (the story and exercises), guidance model (e.g., minimal, contact on request or no guidance) and platform (app, website or as a book) as separate but related parts means that Step-by-Step has the flexibility to be used in multiple ways.

Conclusions

WHO has developed an online psychological intervention for people with depression which is currently being tested in an uncontrolled pilot study in Lebanon. By considering the overall end goal—an adaptable evidence-based intervention system that is scalable in multiple settings—as well as design and psychological theory, the work is leading to several developments that may have implications beyond the Step-by-Step intervention. These include: (I) an understanding of how to develop content that can be deployed in multiple ways depending on resources available and the context; (II) a flexible guidance model that allows for an intervention to be used with no or different intensities of guidance; (III) the prospect of a delivery platform that can be used with other interventions of a similar format (e.g., narrative story and interactive exercises); (IV) a system that is expandable to include other therapeutic components. The next steps are to test the smartphone app and web version of the intervention in at least two randomized controlled trials and learn further about efficacy and feasibility of implementation following the Medical Research Council's Guidance on developing complex interventions (16).

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Informed consent is not required because data collected and provided could not be tracked back to individuals.

Disclaimer: The opinions expressed in this paper are those of the authors and do not necessarily represent the decisions, policies, or views of the WHO.

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