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Adaptation of a Behavioural Activation Intervention for Depression in People with Diabetes in Bangladesh and Pakistan: DiaDeM Intervention

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Abstract

The cultural tailoring of interventions is a cost-effective approach to reach underserved populations. There are multiple frameworks for intervention adaptation, however, information on their use in practice, and sources to guide the adaptations is limited. The aim of this paper is to describe our experience using intervention adaptation frameworks and illustrate the adaptation process of a behavioural activation intervention for depression in people with type 2 diabetes in Bangladesh and Pakistan. We were guided by the intervention mapping adaptation framework for development and evaluation of health interventions and the Bernal and the Escoffery frameworks to address the cultural components of the adaptation. We performed a needs assessment, developed a logic model and systematically searched for available evidence-based interventions. To obtain evidence to guide the adaptations, we conducted a literature review, a qualitative study and workshops with community, expert advisory panels and a co-design group which systematically fed into the adaptation process. We co-produced the materials (training manual and booklet) with stakeholders. Finally, an implementation and evaluation plan was produced to test the feasibility and effectiveness of the intervention. We selected 3 interventions that had a good fit for our target population. Guided by the logic model, we identified core components of these interventions that could not be changed. We made changes in the language, pictures, illustrations, intervention dose and delivery (self-guided versus facilitator), inclusion of carers and/or family members, and training intensity. We developed a protocol to test the feasibility and effectiveness of the intervention considering key changes from the original intervention and the characteristics of the new setting and target population. Intervention adaptation frameworks proved to be valuable tools to guide the intervention process, and ensure the inclusion of multiple sources of evidence and key stakeholders.

Keywords Diabetes · Depression · Behavioural activation · South Asia · Intervention adaptation

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Introduction

People with type 2 diabetes have two to three times higher risk of having depression which is associated with a significant impact on quality of life and an increase in premature mortality (Mendenhall et al., 2014; World Health Organization, 2016). Data from 2019 indicate that depression is the third leading cause of years lived with disability (YLD), contributing 4.2% (34 million) of total YLD, globally (Herrman et al., 2019). Comorbid diabetes and depression are associated with poor glycaemic control, impaired diabetes self-management, increased risk of diabetes complications, longer duration and recurrence of depressive episodes, and a 1.5 higher risk of mortality (Van Dooren et al., 2013). Driven by rapid demographic and behavioural changes, the prevalence of diabetes is now 8.5% globally, with a particularly steep trajectory in low- and middle-income countries (LMICs) (Ogurtsova et al., 2017). In South Asia, diabetes is now the single, most prevalent non-communicable disease (NCD) (Foreman et al., 2018; World Health Organization, 2016). Community studies report the prevalence of diabetes within the population as being 11.4% in Bangladesh (Fottrell et al., 2018) and 16.7% in Pakistan (Aamir et al., 2019) and the prevalence of depression in people with diabetes to be 36% in Bangladesh, (Roy et al., 2012) and 26% in Pakistan (Basit et al., 2018). Diabetes now ranks in the top 5 causes of years lived with disability, and diabetes-associated deaths stand at over 4.2 million annually worldwide(Herrman et al., 2019).

Depression is amenable to treatment with relatively low-cost psychological therapies (Thase et al., 2020). Despite this, healthcare services usually fail to detect or treat depression in people with NCDs, particularly in LMICs (World Health Organisation, 2014). Behavioural Activation (BA) is a simple, flexible and effective psychological therapy for depression and has shown to be portable across cultures (Kanter et al., 2012; Veale, 2008). BA focusses on the link between behaviour and mood rather than thoughts and low mood (Kanter et al., 2012; Veale, 2008). Focussing on behaviour change sidesteps alternative beliefs about depression, such as having a faith/spiritual basis (for example, being punished by God, being possessed by a demon) without the therapist being required to support the depressed person to tackle associated negative stigmatising thinking patterns (cognitive restructuring). As the depressed person re-engages in positively rewarding activities their attention is directed away from ruminating about negative thoughts towards experiencing positive emotions such as pleasure and achievement. Thus, it may be more acceptable to overcome barriers identified in the South Asian population such as stigma, knowledge about psychotherapy or conflicting cultural beliefs (Johnson et al., 2021; Moller et al., 2016). There is scarce evidence of the effectiveness of BA in people with comorbid long-term conditions (Uphoff et al., 2020). Most of the evidence comes from high-income countries (HICs). However, there are two very relevant studies from South Asia (Ali et al., 2020; Johnson et al., 2021).

Cultural adaptation involves modifying an existing intervention to consider language, context, culture (spiritual beliefs and social norms) and the needs of the local population (Mabunda et al., 2022). This is essential in improving attitudes towards a health or psychological intervention and has been shown to be effective to reach underserved populations (Guillermo Bernal et al., 2009; Mashaphu et al., 2021). There are multiple frameworks to refine and culturally adapt interventions (Bernal et al., 1995; Escoffery et al., 2019). However, there are very few reports or case studies that describe in detail how to use these frameworks to successfully adapt an intervention.

The aim of this paper is to illustrate the adaptation process of a BA intervention for people with depression and type 2 diabetes in Bangladesh and Pakistan (DiaDeM), guided by process and content intervention adaptation frameworks. We also highlight the facilitators and challenges experienced to help guide others using these frameworks.

Methods

As seen in Fig. 1, the adaptation was guided by five steps of the intervention mapping adaptation framework for development, implementation and evaluation of health promotion interventions (Highfield et al., 2015), and the Bernal and the Escoffery frameworks to address the cultural and context components of the adaptation process (Bernal et al., 1995; Escoffery et al., 2019). The Stirman adaptation classification was used to map the changes made to the original intervention (Stirman et al., 2013). We used an iterative approach, which made it possible to move back and forth between steps according to feedback from stakeholders at each stage.

During the process, we used a mixed-methods approach to obtain information to guide the adaptation. We performed a needs assessment, developed a logic model, drafted an adaptation plan and produced the adapted intervention. To obtain evidence to guide these adaptations, we conducted a literature review, a qualitative study and workshops with community, expert advisory panels and a co-design group which systematically fed to the core team (i.e. co-authors) during the adaptation process.

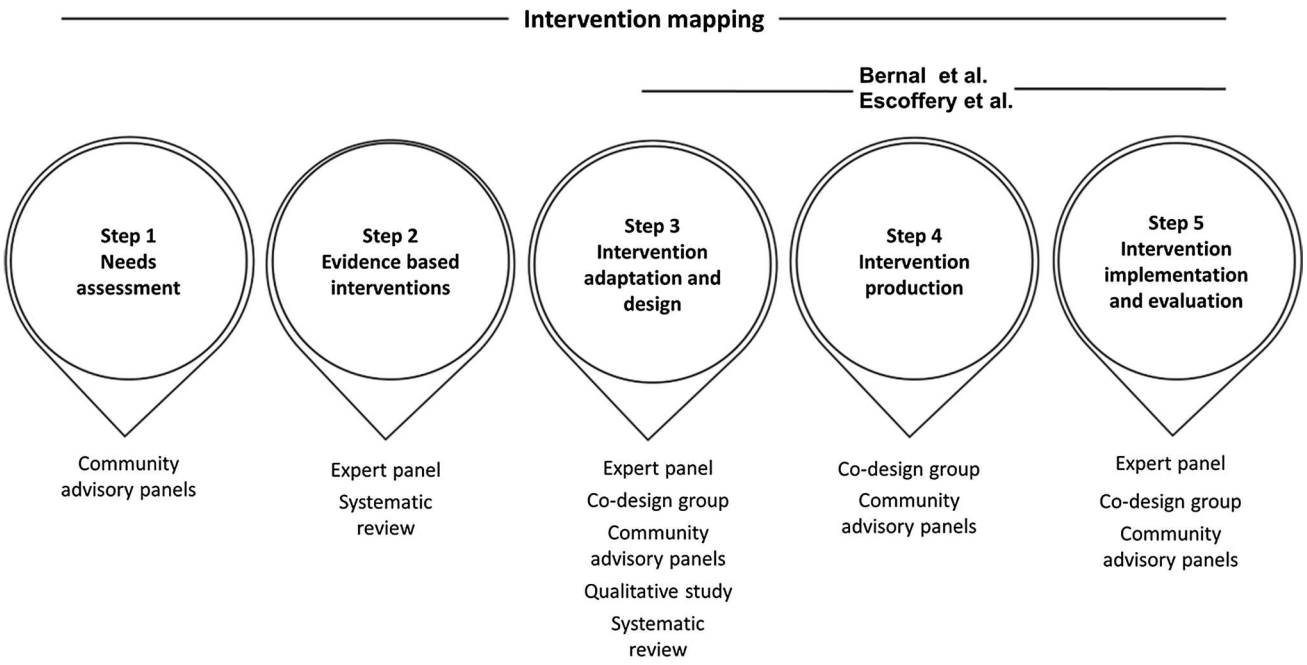

Fig. 1 Intervention adaptation flowchart

Systematic Review

We conducted a systematic review according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021), we evaluated the number and effectiveness of psychological interventions for depression in people with non-communicable diseases (NCDs) in South Asia. We also explored the individual, organisational and policy-level barriers and facilitators for implementation and scaling up of these interventions. ASSIA, CINAHL, EMBASE, Global Health, IMEMR, ISMEAR, MEDLINE and PsycInfo databases were searched in April 2022, together with web pages and databases of the World Health Organisation, World Bank and the Ministry of Health in Bangladesh and Pakistan. Screening, data extraction and risk of bias assessments were performed independently by two co-authors, with disagreements resolved by consensus. Individual and organisational barriers and facilitators were identified from relevant interventions and policy documents and extracted using the theoretical domain framework (Atkins et al., 2017). More detailed information about the methods are available in Supplementary Material 4, and results of the systematic review will be available in the review paper (Zavala et al., 2022).

Qualitative Study

We conducted a qualitative study to explore acceptability, feasibility and opportunities to integrate BA in diabetes care. A total of 48 semi-structured interviews were conducted ($n=25$ in Bangladesh and $n=23$ in Pakistan) with patients diagnosed with depression and diabetes ($n=18$), healthcare workers ($n=22$) and policy makers ($n=8$). Topic guides for each group were developed based on the objectives of the study and piloted in-country. Participants were recruited purposely to include a variety of characteristics (gender and socioeconomic position). Interviews were conducted in Bangla, Pashto or Urdu by trained researchers, transcribed and translated into English. Data were analysed thematically according to the "Kiger and Varpio's approach" using NVivo20 software to collate and manage data (Kiger & Varpio, 2020) and coded with the assistance of the software NVIVO. Ethics approval was granted by the University of York (HSRGC/2020/409/B)., Khyber Medical University (DIR/KMU/UEC/25)., Rawalpindi Medical School (242/IREF/RMU/2020) and Diabetic Association from Bangladesh (BADAS-ERC/EC/20/00300) for the study as part of the wider DiaDeM study (publication forthcoming). More details about the methods are available in Supplementary Material 5.

DiaDeM Core Team

We established a multidisciplinary team including psychiatrists, diabetologists, public health experts from Bangladesh and Pakistan, health psychologists, epidemiologists and BA intervention developers to adapt the intervention. The core team designed the mixed-methods studies and were responsible to integrate the opinions of the community, expert and co-design groups into the intervention.

Community Advisory Panels

We recruited people with depression and diabetes, caregivers, and health workers from Bangladesh and Pakistan interested in the development of the intervention. Stakeholders were recruited through links with the health provider and non-governmental organisations in each country. Two researchers (one for each country) from the DiaDeM core team were responsible to communicate with the community advisory panel, organise the workshops, collate the information and report back to the core team (FA, RH). We conducted a series of workshops with the community panel at each step of the intervention development. Findings from both the qualitative study and the systematic review were shared with the participants and their views on the barriers and facilitators to the intervention delivery were captured. The translated versions (language and adaptations) of the proposed intervention materials (manual and booklet) were shared with the members for their feedback thought the adaptation process (Fig. 1).

Expert Panel

We invited intervention developers and researchers with experience of delivering BA interventions and trials in LMICs to participate in a two-day workshop. This was to provide an insight into the availability of BA interventions for the target population and any barriers they identified. We used a semi-structured approach, presenting the findings from the systematic review and qualitative study and asking them about additional barriers and facilitators for the development, delivery and evaluation of these interventions (Fig. 1). One researcher from the DiaDeM core team (GZ) was responsible to organise the expert panel workshops, collect the relevant information and report back to the core group.

Co-design Group

We formed a co-design group that included mental health experts (psychologists and psychiatrists), diabetologists/endocrinologists, patients and their caretakers, public health experts, graphic designers and the research team. Similarly to the community advisory and expert panel, one researcher from the core team (FA) organised the workshops, coordinated the co-design group activities and reported back to the core team. We held a series of workshops with the co-design group, which provided input and feedback about steps 3–5 of the process (Fig. 1).

Intervention Mapping

Step 1: Needs Assessment, Organisation Capacities and Logic Model

The DiaDeM core group performed a needs assessment using information collected from the qualitative study, systematic reviews, public health experts in the country and the community advisory panel (Fig. 1).

We developed a logic model based on the desired outcome "to improve depression in people with diabetes in Bangladesh and Pakistan". To understand the "mechanisms of action" through which the intervention affects behaviour, we identified behavioural change techniques and the mechanisms of action they target (Carey et al., 2019).

Step 2: Search for Evidence-Based Interventions

We identified relevant BA interventions from systematic reviews and held consultations with the expert panel to identify relevant BA interventions that could fit our target population. The DiaDeM core group held a series of workshops to evaluate the available interventions to select the best fit.

Step 3: Intervention Adaptation and Design

We systematically evaluated the barriers and facilitators to deliver BA in the context of South Asia using the Bernal and Escoffery frameworks, which include domains of language, persons, metaphors, content, concepts, goals, methods, context, environment, population and setting (Bernal et al., 1995; Escoffery et al., 2019). We conducted two workshops with the expert panel and two workshops with the community panel, where we presented the information gathered from the review and qualitative study and asked the panels to identify additional barriers and facilitators to implement a BA intervention in Bangladesh and Pakistan. The co-design group evaluated all suggestions and provided additional input.

Step 4: Intervention Production

Using the information gathered, we planned a list of changes to be made to the original intervention using the Stirman adaptation classification to map the changes made to the original intervention (Stirman et al., 2013). We produced

adapted materials (i.e. Intervention manual, participant booklet and training resources for facilitators). All the materials (facilitator checklist and participant BA booklet) were co-developed in collaboration with the community advisory panel and the co-design group. The co-design group made observations, provided feedback and reached consensus about each adaptation made to the intervention. The new adapted intervention was pre-tested in a group of final users (people with depression and diabetes and facilitators).

Step 5: Program Implementation and Evaluation Plan

A plan for the implementation of DiaDeM was developed. We identified possible facilitators and supervisors for the delivery of the intervention. A screening tool for the detection of depression in patients with diabetes was selected and implemented in the investigation sites. A protocol to test the feasibility of the intervention was developed and is available elsewhere (Aslam et al., 2022). We updated the logic model considering the modifications to the intervention. Behavioural change techniques were linked to the mechanisms of action and the best available tools to measure mediators were selected using the online mapping tool (Johnston et al., 2021).

Results

Table 1 summarises the activities we performed in each step of the intervention mapping adaptation process.

Step 1: Needs Assessment, Organisation Capacities and Logic Model

In the needs assessment we identified that there is a lack of evidence to inform practice, with little LMIC-based evidence on how to integrate and implement depression and diabetes care. In Bangladesh and Pakistan, diabetes services are relatively well-developed and are mostly based in (public and private) secondary/tertiary care settings. However, mental healthcare is not generally offered as part of diabetes services. Moreover, access to mental health services outside diabetes care is limited and confined to specialist tertiary centres. Integrating the recognition and treatment of depression within diabetes care using BA offers an opportunity to address the gap in mental health service provision and to improve mental health, quality of life and diabetes outcomes.

As seen in supplementary Table 1, we identified a very limited number of interventions addressing depression in people with long-term conditions in South Asia. We found no examples of integration of mental and physical health in general practice and no interventions to treat depression in people with diabetes in Bangladesh and Pakistan. However, the few studies of available psychological therapies for people with long-term conditions in South Asia demonstrated a reduction in depressive and anxiety symptoms.

We identified the need to develop and test the feasibility, acceptability and effectiveness of simple talking therapies that could be integrated into diabetes care in South Asia.

As shown in Table 1, we developed an initial logic model, which summarises the core activities that should be completed to achieve the desired outcomes. The logic model did not suffer any change after the adaptation process.

Step 2: Search for Evidence-Based Interventions

The DiaDeM core group identified seven BA interventions for treating depression, of these seven interventions only the INDEPENDENT study (which provided BA components as part of a collaborative care package in India) was conducted in South Asia (Ali et al., 2020). After exploring all the available interventions identified by the DiaDeM core group and the expert panel, we decided to use materials from three BA interventions (MODS, BASIL and CHEMIST). These were chosen as they have been adapted for delivery by non-mental health specialists in other settings for participants with multiple health conditions and depression. Qualitative evaluation in those studies indicated the intervention to be acceptable for both non-specialist intervention facilitators and study participants (Burke et al., 2022; Littlewood et al., 2022).

Step 3: Intervention Adaptation and Design

We reviewed the MODS, BASIL + and CHEMIST intervention and separated each one of its components. We evaluated which components were central to the function of the intervention according to the logic model (Table 1).

As seen in Supplementary Table S2, we identified barriers and facilitators in all domains of the Bernal cultural adaptation framework, the most important barriers were accommodating in-country local languages and dialects, the use of complex medical terms in the intervention, health literacy of the population including lack of awareness about mental health in the population. Other barriers identified were the lack of protocols and policies in the healthcare/national setting and a lack of mental health training amongst doctors treating these patients. Being seen by different healthcare professionals for each (follow-up) appointment was considered a barrier to establishing a trusting relationship between the patient and the healthcare professional. Women were considered to face more challenges than men in accessing the healthcare services in the region (they had greater restrictions in travel often relying on male relatives to accompany them to services and had less access to finances for example).

Table 1 DiaDeM logic model

Resources	Activities (Behavioural change techniques)[a]	Outputs	Outcomes			Impact
			Short-term (Mechanisms of action)[b]	Medium-term (Behaviours)	Long-term (Health changes)	
Session 1: Introduction Training Trained staff Treatment costs Patient time Patient travel	*Information gathering* 2.2 Feedback on behaviour 2.7 Feedback on outcomes(s) of behaviour *Information giving* 4.2 Information about Antecedents *Shared decision making* 1.1 Goal setting (behaviour)	Evidence of fidelity of delivery by therapist	Motivation Feedback processes Knowledge Behavioural regulation Intention Goals	Diabetes self-care behaviours Balanced routine, necessary and pleasurable behaviours	Depressive symptoms Glycaemic control (HbAlc)	Mental health Wellbeing Diabetic complications Healthcare costs Earnings Employment Stigma QOL
Sessions 2–5: BA Work Training Trained staff Treatment costs Patient time Patient travel	*Information gathering* 2.2 Feedback on behaviour 2.7 Feedback on outcome(s) of behaviour 5.6 Information about emotional consequences 10.4 Social reward *Information giving* 4.2 Information about Antecedents *Shared decision making* 1.1 Goal setting (behaviour) 1.4 Action planning 2.2 Feedback on behaviour	Evidence of fidelity of delivery by therapist Workbook completion	Motivation Feedback processes Knowledge Behavioural cueing Behavioural regulation Intention Goals Beliefs about consequences			

Table 1 (continued)

Resources	Activities (Behavioural change techniques)[a]	Outputs	Outcomes			Impact
			Short-term (Mechanisms of action)[b]	Medium-term (Behaviours)	Long-term (Health changes)	
	2.3 Self-monitoring of behaviour					
	2.4 Self-monitoring of outcome(s) of behaviour					
	2.7 Feedback on outcome(s) of behaviour					
	5.4 Monitoring of emotional consequences					
Homework via workbook (alongside sessions 2–5)	*Information giving*	Workbook completion	Knowledge			
Co-design resources	4.2 Information about Antecedents		Behavioural regulation Intention			
Stakeholder	5.6 Information about emotional consequences		Goals			
Printing	*Shared decision making*		Behavioural cueing			
	1.1 Goal setting (behaviour)		Beliefs about consequences			
	1.4 Action planning					
	2.3 Self-monitoring of behaviour					
	2.4 Self-monitoring of outcome(s) of behaviour					
	8.2 Behaviour substitution					
	5.4 Monitoring of emotional consequences					

Table 1 (continued)

Resources	Activities (Behavioural change techniques)[a]	Outputs	Outcomes			Impact
			Short-term (Mechanisms of action)[b]	Medium-term (Behaviours)	Long-term (Health changes)	
Session 6: Final 'wrap up'	Information gathering 2.2 Feedback on behaviour 2.7 Feedback on outcome(s) of behaviour 5.6 Information about emotional consequences Information Giving 4.2 Information about Antecedents 10.4. Social reward	Evidence of fidelity if delivered by the therapist	Motivation			
Training	Workbook completion		Feedback process			
Trained staff			Knowledge			
Treatment costs			Behavioural regulation			
Patient time			Belief about consequences			
Patient travel						

[a]Michie et al. (2013)

[b]Johnston et al. (2018)

Effective communication between the healthcare professional and the patient was considered as a facilitator for the intervention delivery. It was emphasised that the intervention sessions should be connected with diabetes-related follow-up appointments to improve patient adherence and avoid multiple visits to the healthcare centre. All stakeholders acknowledged that the core components of BA cycle are compatible with culture and values in both Bangladesh and Pakistan.

Step 4: Intervention Production

Supplementary Table 2 shows a detailed description of the components of the three source BA interventions which we adapted and the source of information to make that decision. We produced all the materials in collaboration with the co-design group. The scripts of the three interventions were modified to focus on diabetes instead of multiple health conditions, and information about appropriate local support groups and helplines were added for patient information. Examples for different activities in the materials and the pictures were replaced with alternatives that were culturally relevant to Bangladesh and Pakistan. To improve patients' understanding, illustrative stickers were added to reflect patients' activities and moods.

We pre-tested the manual and booklet through role play, with the team members and the facilitators, to identify the further changes needed, and requested final approval from the co-design group and community panel. Finally, all the materials were translated into local language by bilingual health professionals, and they were approved by the co-design group and community panel. A detailed description of the adaptation and the level of adaptation (using Stirman classification) is provided in Supplementary Table 3.

Step 5: Programme Implementation and Evaluation Plan

We identified non-mental health specialists, working within diabetes care services, for delivering the BA intervention ('BA facilitators').

We planned and executed activities to motivate and train the BA facilitators. These activities included two one-hour webinars to provide a brief overview of depression, the behaviour change model and the BA. Subsequent to the webinars, an open online course, designed by the core team, was provided. The online course consisted of three self-reflective sessions on depression and BA in the context of a 9-h training session moderated by members of the research team. Finally a 15-h 'in-person' experiential learning course led by a BA expert from the UK and supported by members of the local research teams to act as translators as needed was delivered. The training course covered the content of the six BA sessions of the intervention in detail, as well as how to use effective communication skills to engage participants in using BA techniques between sessions. The training also included guidelines for both in-person or telephone delivery of the intervention.

Training techniques employed were information giving, demonstration, interactive discussion, small group work and role play.

After training, BA facilitators participated in a simulation of session one of the intervention to assess their competency in delivering the BA. Competency was measured using a standardised fidelity index administered by BA supervisors. BA facilitators unable to demonstrate competency in measured skills were provided with targeted revision training by the supervisor before reassessment. One learner was unable to demonstrate the required level of competency after receiving revision training and subsequently, did not continue with the trial.

A protocol to test the feasibility of the adapted BA intervention was developed (Aslam et al., 2022). The protocol includes detailed information about the intensity and frequency of the intervention sessions and information about the mixed-methods process to evaluate the fidelity, acceptability, feasibility and mediators of action (Aslam et al., 2022).

Discussion

We adapted a BA intervention for depression in people with diabetes to culturally fit the population in Bangladesh and Pakistan (DiaDeM). This was developed by adapting the materials from CHEMIST, BASIL + and MODS BA interventions and using the most up-to-date evidence to extract information about barriers and facilitators to deliver the intervention. The necessary adaptations were performed using process (intervention mapping adaptation) and content (Bernal and the Escoffery) frameworks for intervention adaptation guided by a co-design group, a community and expert panels including a wide range of stakeholders. We will further evaluate the feasibility and effectiveness of the DiaDeM-adapted intervention by comparing it with optimised usual care in a randomised controlled trial (Aslam et al., 2022).

Similarly, to our finding, the use of illustrations to cater to a wider audience has been reported as a useful tool to enhance the acceptability and effectiveness of health interventions in LMICs (Ramos & Alegría, 2014). Development of future interventions should prioritise the use of illustrations to improve the patients' understanding of interventions in LMICs. Such individuals represent a vulnerable sector of society who has consistently experienced health inequalities (Ellermann, 2017).

The importance of including carers and family members was highlighted in all the sources of evidence. Patients rely on their family as part of their support network whilst family members can be keen on being involved (Datta et al., 2015; Sattler et al., 2022). This is especially prominent in diabetes patients as dietary management is crucial in diabetes control and food is normally prepared and eaten with family members or carers (Rao et al., 2016); (Baig et al., 2015). Family members also can play a paternal role in dietary management leading to patients feeling a sense of lost control. Patients with diabetes in non-supportive families have been shown to have worse glycaemic control and diabetes self-management (Baig et al., 2015). Family members also can motivate patients to partake in beneficial activities increasing the effectiveness of BA (Solomonov et al., 2019). Family members may be able to interpret resources and guide them. Some studies identified a more family orientated culture in South Asia emphasising the need for their inclusion (Karasz et al., 2019). Misinformation amongst family members can perpetuate stigma and isolation amongst patients. These factors contribute to the worsening of depression (Karasz et al., 2019). Inclusion of family members and carers can provide an opportunity to suggest better interfamilial dynamics and address stigma around the disease.

The cultural adaptation of psychological interventions has been well documented. However, there are still challenges to evaluating and scaling up interventions specially in LMICs, where disparities in the evaluation and implementation of interventions have been reported (Carey, 2021; Zavala et al., 2022). We found many frameworks for intervention adaptation. However, few studies provide a detailed account of the steps and resources needed for each part of the adaptation process. The current paper addresses this research gap, providing detailed information about the steps and the stakeholders involved in each step of the adaptation process, providing more tools to researchers and stakeholders working on cultural intervention adaptations.

Strengths and Limitations

There are several limitations that deserve further attention. Members of the community panels and co-design group were recruited from networks of healthcare professionals and the research team, and may be prone to selection bias. The selection of interventions (to adapt from) was influenced by the availability of materials, and there may be other interventions that also may fit the target populations that could not be explored due to time and capacity constraints. The use of adaptation frameworks ensures the inclusion of multiple sources of evidence and stakeholders in the process, however, it does not guarantee the intervention will be successful.

Our study also has several strengths; this work was driven by a needs assessment, where an urgent need for psychological therapies for people with diabetes in Bangladesh and Pakistan was identified. We used the best level of evidence to identify available BA interventions and we took a mixed-methods approach to identify barriers and facilitators for the delivery of interventions, which has shown to increase the richness and robustness of the findings (Guillaumie et al., 2017). We incorporated frameworks focussing on the process and content of the intervention to ensure the best fit to the new target population and to deal with important cultural differences.

Conclusion

We systematically adapted a BA intervention for people with depression and type 2 diabetes in Bangladesh and Pakistan. Cultural and contextual components of the adaptation were adequately incorporated guided by the Bernal and Escoffery frameworks. A diverse group of stakeholders including patients, caregivers, healthcare professionals, mental health experts and researchers were consulted throughout the process. A training program also was designed and implemented to train people working in diabetes care services to become BA facilitators and deliver the intervention. This paper provides detailed information on the adaptation process and the resources used in each step of the adaptation, which could guide the cultural adaptation of further health interventions in low- and middle-income countries.

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Declarations

Competing Interest The authors declare no conflict or competing interest.

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