Translation, Cultural Adaptation, and Mixed-Methods User Feedback of the SelfBack App to the Arabic Language

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Abstract

Background: Low back pain (LBP) is a significant global health concern, adversely impacting affected individual's quality of life. Effective self-management strategies, including digital interventions, are critical to enhancing LBP patients' adherence to treatment regimens. The SelfBack smartphone app exemplifies such digital innovations, with clinical evidence of effectiveness and a focus on personalised user experiences.

Objective: This study describes the translation of the SelfBack app from the English language to the Arabic language, its cultural adaptation into the Saudi context, and an evaluation of the app's perceived usability in a Saudi cohort.

Methods: Five comprehensive stages were used to ensure the quality of the adaptation process of the SelfBack app from the English to the Arabic language. The first stage was the exchange phase where the self-assessment scales, completed at initial registration and weekly update sessions which are used by the app to tailor treatment, were changed from English to validated Arabic language versions. The second stage was the translation and cultural adaptation phase which translated the content of the patient self-management plan and adapted it for cultural relevance. The third stage was the audio conversion phase which translated the English audio educational materials to Arabic. The fourth stage was a laboratory usability testing phase which integrated the new Arabic content across all app features, ensuring the interface accommodated the new language format. The fifth stage was a field usability testing phase which used the Arabic version of the System Usability Scale (A-SUS) and participant interviews to evaluate the Arabic SelfBack app's performance using a sample of 11 participants with non-specific LBP.

Results: The stages of translation and cultural adaption are reported in detail and the expert panel members reported no misunderstandings and a few minor discrepancies in the Arabic version of the SelfBack app's content or software interface. The SUS score was 70% for the participants in the field usability testing, reflecting a good level of usability. Interview responses were consistent with these SUS results, suggesting the app was clear and easy to use. However, some negative feedback was received concerning the number of mandatory questions, lack of interaction, repetitive content and unmet expectations which could potentially be addressed in future updates.

Conclusions: High user satisfaction, ease of use, and interface efficiency were observed, with only minor criticisms encountered, for the newly developed Arabic version of the SelfBack app. These results suggest that the Arabic SelfBack app is ready for research testing in clinical practice involving Arabic-speaking participants. Clinical Trial: The study was approved by the Institutional Review Board for Health Sciences Colleges Research on Human Subjects at the College of Medicine at King Saud University (# E-22-7106). All participants signed a consent form.

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Background: Low back pain (LBP) is a significant global health concern, adversely impacting affected individual's quality of life. Effective self-management strategies, including digital interventions, are critical to enhancing LBP patients' adherence to treatment regimens. The SelfBack smartphone app exemplifies such digital innovations, with clinical evidence of effectiveness and a focus on personalised user experiences.

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Result: The stages of translation and cultural adaption are reported in detail and the expert panel members reported no misunderstandings and a few minor discrepancies in the Arabic version of the SelfBack app's content or software

interface. The SUS score was 70% for the participants in the field usability testing, reflecting a good level of usability. Interview responses were consistent with these SUS results, suggesting the app was clear and easy to use. However, some negative feedback was received concerning the number of mandatory questions, lack of interaction, repetitive content and unmet expectations which could potentially be addressed in future updates.

Conclusions: High user satisfaction, ease of use, and interface efficiency were observed, with only minor criticisms encountered, for the newly developed Arabic version of the SelfBack app. These results suggest that the Arabic SelfBack app is ready for research testing in clinical practice involving Arabic-speaking participants.

Keywords: Low Back Pain; Self-Management; Language; Arab World; Smartphone; Arabic Translation.

Introduction

Low back pain (LBP) is a significant global health concern, adversely impacting a significant portion of the population throughout their lives [1]. It ranks among the leading causes of disability in adults and generates a substantial public health burden due to its impact on affected individuals' well-being and quality of life [2].

Clinical guidelines advocate that LBP patients be provided with supported self-management strategies so that they are empowered to manage their pain. These strategies include exercise, education, pain relief, lifestyle advice around sleep, diet and stress, as well as advice regarding work and maintaining normal activities [3]. However, people with LBP often find it hard to implement these strategies due to a lack of knowledge, fears about doing the wrong thing, lack of confidence, competing routines, feeling overwhelmed by information, limited access to physical activity resources, a lack of trust in what to do, and a lack of feedback about the benefits of adhering to their treatment regimens [4]. Digital interventions, including smartphone apps, have emerged as promising solutions to overcome these challenges [5]. They offer evidence-based and cost-effective methods for delivering self-management solutions for people with LBP [4].

While a systematic review found there are numerous LBP apps available, their overall quality was often poor, characterized by a lack of engaging features, unattractive interfaces, and unreliable information [6]. The recent National Institute for Health and Care Excellence (NICE) Early Value Assessment of digital self-management apps for LBP [7] identified 10 apps, five of which were recommended for use in the National Health Service (NHS), including SelfBack, and five that can only be used in research. The SelfBack app offers personalized programs and resources to patients, potentially improving access to information and reducing the strain on traditional healthcare systems. The NICE evaluation underscores the growing potential of digital tools in chronic pain management but emphasizes the need for rigorous assessment before mainstream integration.

Various smartphone apps including Spine Zone [8], Pain Coach [9], and getUBetter [10] address LBP self-management. The SelfBack app stands out for its unique evidence-based approach and dedication to personalized user experiences. Its efficacy has been shown in a large randomized controlled trial [4], where participants using SelfBack demonstrated significant reductions in pain and disability compared to a control group after three months.

At present, there are no digital tools available in the Arabic language for supporting self-management for people with LBP. Other self-management apps for different health conditions such as the Sehhaty app (the Saudi governmental health platform) [11] and the Sehhaty Wa Daghty app have demonstrated effectiveness in the Saudi cultural context [12]. Therefore, the development of an app supporting self-management for Arabic-speaking people with LBP is important. However, translating software app content involves much more than

just basic word-for-word translation. It requires a nuanced approach that considers cultural context, user experience and technical limitations. The objectives of this study were, therefore, to translate and culturally adapt the English language version of the SelfBack app to the Arabic language and evaluate user satisfaction.

Methods

Design

A prospective study was conducted to assess user satisfaction with the SelfBack app after its translation and cultural adaptation from English to Arabic. The study was approved by the Institutional Review Board for Health Sciences Colleges Research on Human Subjects at the College of Medicine at King Saud University (# E-22-7106). All participants signed a consent form.

The SelfBack app

The SelfBack app is a smartphone app that uses artificial intelligence to create personalised self-management plans for people with non-specific LBP based on individual person data within a case-based reasoning (CBR) system, as shown in Figure (1) [4]. It is designed for self-management and uses an evidence-based decision support system (DSS). The app works by first asking the person to fill out a range of scales and questionnaires about their LBP condition. For example, it asks about their pain severity, functional ability, fear avoidance behaviours, workability, perceived barriers to self-management, pain self-efficacy, sleep, perceived stress, and mood. This information is then used to create a personalized treatment plan, which consists of a combination of physical exercises and educational materials.

The treatment plan is updated weekly based on physical activity monitoring and self-reported adherence to the self-management plan. The app uses the person’s smartphone to track their physical activity levels, or can link to a wearable step counter if the person has one. This information is used to ensure that the treatment plan is challenging, but not too difficult, and to identify any areas where the person may need additional support.

To use the SelfBack app, a person first needs to download the app from the App Store or Google Play. For the purpose of this research, patients were initially screened by their treating clinician as appropriate (see details below), before being sign-posted to the App and provided with a token to enable the App to be downloaded for free. Once the app was installed on their phone, they created an account and filled out a range of questions about their condition to initiate their individual treatment plan. The treatment plan remains dynamic and depends on the person’s progress, which is adjusted weekly as needed.

Translation and Cultural Adaptation

The translation and cultural adaptation of the SelfBack app contents from the English language to the Arabic language required a multi-step design approach to ensure it was of high quality [13]. The method comprised five phases:

1. Exchange phase. This phase involved exchanging the SelfBack self-

assessment scales and questionnaires used at the baseline and weekly question/answer sessions from the English language version to translated and validated Arabic versions. The investigators (HS, MA) identified ready-to-use Arabic-translated scales and, if necessary, obtained permission for their use.

2. ***Translation and cultural adaptation phase.*** This phase focused on the text content of the SelfBackpatient self-management plan, translating and culturally adapting it into the Arabic language. This was based on the principles described by Wild et al (2005) [14] using a multi-step approach: preparation, forward translation to the Arabic language, cultural adaptation, quality assurance, comparison of the two versions by an expert panel, proofreading and adding the final Arabic version to the SelfBack app. To ensure the quality of translation, various steps involving translation were undertaken by native Arabic and English speakers at an authorised language translation service centre. The cultural adaptation step focused on replacing common English sayings with Arabic sayings (e.g. the statement 'trouble sleeping' was replaced by 'difficulty sleeping'), this was done by expert bilingual physiotherapists (HA, MA). The quality assurance step was carried out by the expert (HS, MA). Comparison of the two versions (English and Arabic) was undertaken by an expert panel comprising two investigators (HS, MA) and a consultant psychologist who compared the original English version with the translated Arabic version to assess linguistic equivalency and correct spelling, and that the two versions were conceptually equivalent. Final proofreading was conducted by an investigator (HS). Adding the final Arabic version to the SelfBack app was undertaken by the software developers of the SelfBack app.
3. ***Audio conversion phase.*** This phase involved converting the English language audio educational materials to the Arabic language, using the principles described by Wild et al (2005) [14], and requiring multi-steps as follows: preparation, forward translation to the Arabic language, cultural adaptation, quality assurance, comparison of the two versions by an expert panel, audio recording, proof listening and adding the final Arabic version to the SelfBack app. These steps were, mostly, undertaken as described for the translation and cultural adaptation phase. However, in this phase, the expert panel selected one person out of three candidates to record the audio recordings based on their ability to speak clearly, understandably and in a professional tone.
4. ***Laboratory usability test phase.*** This phase addressed the software interface text of all features by allocating the Arabic materials of the SelfBack app to the appropriate place in the app. This phase involved carefully considering the differences between the English and Arabic languages, in particular in terms of the direction of text writing being right to left in Arabic and that it is not possible to divide Arabic words when starting new lines. Thus, in this phase, the main focus of the investigators (HS, MD) was to address the software interface text of all features by allocating the Arabic materials to the appropriate place in the SelfBack app.

5. ***Clinical usability testing phase.*** This phase involved assessing the usability of the Arabic SelfBack app for both the Android and iOS operating systems using the validated and translated Arabic version of the System Usability Scale (A-SUS) [15]. The SUS is a questionnaire used to evaluate the usability of a wide variety of new software systems [16]. It comprises 10 questions which are answered using a five-point Likert scale ranging from 'I strongly disagree' to 'I strongly agree'. The SUS generates a score (range 0 to 100) and offers information about overall customer satisfaction and usability [17]. Additionally, to assess user experience with the app, one-to-one phone interviews were undertaken using one open-ended question 'What feedback do you have after using the Arabic version of the SelfBack software application? List three important features. Participants for this phase were recruited randomly from the Primary Care Clinic at the King Khalid University Hospital, Riyadh, Saudi Arabia. Eligibility criteria were adult patients (≥ 18 years), diagnosed with LBP, and used the SelfBack app for more than 3 months. Exclusion criteria were previous surgery for their back problem, diagnosis of specific spine pathology such as spinal stenosis, herniated disc problems, pregnancy-related back pain, and any other reason why the clinician felt that self-management via the SelfBack app was not suitable.

Data Analysis

Quantitative data from the A-SUS (10 questions) were analysed using IBM SPSS Statistical for Windows, version 25,0 (IBM Corp). A higher SUS score indicates improved usability, whereas a lower score indicates possible usability issues. The average score is 68%, and scores above 70% indicate a good and decent level of usability, while scores below 50% indicate low usability and suggest a need for improvement [17].

Data from the open question regarding user experience were analyzed using qualitative content analysis by counting the frequency of the creating codes in the transcribed text from the phone interviews. A thematic analysis of interview data was conducted manually and the participants' answers were translated from Arabic to English by two experts (HS, MD).

Results

Translation and Cultural Adaptation Phase

The expert panel participants during the translation and cultural adaptation phases did not report any misunderstandings and only a minor few discrepancies with the translated and culturally adapted instructions and educational materials.

Clinical Usability Testing

Eleven people with non-specific LBP participated in the field usability testing. As shown in Table 1, there were 10 (91%) females with ages ranging from 31-58 years.

Arabic System Usability Scale

The median (SD) A-SUS score was 70% (5), reflecting a 'good' level of usability [16]. In addition, the answers to the open-ended question were consistent with

the SUS outcomes.

Qualitative Analysis

The thematic analysis data were organised hierarchically using a code frame to develop sentiment analysis by identifying patterns and themes. Based on the feedback received, two main themes emerged: positive and negative. The positive feedback theme comprised three sub-themes: ease of use, clear language and good audiovisual features. The negative feedback theme consisted of four sub-themes: answering mandatory questions, lack of interaction, repetitive content, and below-average app features.

Positive feedback (A)

Theme (A1) Easy to Use: P1, P2, P3, P4, P5, P8, P10

Feedback highlighted the user-friendly nature of the app, with participants (n = 7) expressing appreciation for its simplicity and ease of use.

P1: “The app was clear and easy to use.”

P10: “It is my first time using such these kinds of applications. Once I understood the idea, then the uses were easy for me.”

Theme (A2) Clear Language: P2, P5

This theme reflected the clarity of the Arabic language and its integration into the app (n = 2).

P2: “Easy to use and the language is understandable and direct.”

Theme (A3) Good Audiovisual Features: P2, P7

Positive feedback was received for the SelfBack app's useful audio and visual features (n = 2).

P7: “The exercise pictures, sound and instructions are clear.”

Negative feedback (B)

Theme (B1) Answering the Mandatory Questions: P1, P3, P5, P7

Participants (n = 4) expressed their opinions on the mandatory and complicated process of having to ask consistent questions every time they use the app. They provided different feedback, including that it consumed too much of their time and led to frustration or quitting using the app altogether.

P3: “Everything in the app is easy, but every time I log in, I have to answer the same question over and over.”

Theme (B2) Lack of Interaction: P3, P6, P10

This theme pertained to the uncertainty around whether they are using the app correctly or if they should stop using it. Additionally, this feedback suggested that there was a lack of real interaction with healthcare practitioners (n = 3)

P6: “No interaction.”

P10: “It is my first time using such these kinds of applications. Once I understood the idea, then the uses were easy for me. But I want someone to follow up with me.”

Theme (B4) Repetitive Content: P8, P9

This theme concerned negative feedback regarding repeating instructions and exercises over time, regardless of LBP severity (n = 2).

P9: “It was beneficial, my comment is for how long should I have to use it? Because the app keeps repeating the same exercise.”

Theme (B5) Below Expectations: P11

This subtheme pertained to a user’s expectations of the app in comparison to other apps (n = 1).

P11: “The app was below my expectations and there is nothing special about it. There is another app with superior features that gives you more exercise and interaction.”

Discussion

This study successfully translated and culturally adapted the English language version of the SelfBack app to the Arabic language and conducted a mixed-methods user feedback evaluation of the Arabic version. The process of translating and culturally adapting the app was smooth, with the expert panel positive and unable to identify any further misunderstandings or discrepancies due to the language used. There were 11 participants who participated in the clinical usability testing of the Arabic SelfBack app. Overall, their feelings were mixed giving the app a ‘good’ usability score rating. Individual interviews revealed both positive and negative in-depth feedback. Positive feedback themes centred on the user-friendly nature of the app, its simplicity, clarity of the Arabic language, and good audiovisual features. Negative feedback concerns the length of mandatory questions, lack of user interactivity, repetitive content, and below-average app features.

The usability and acceptability findings of this study align with previous assessments of SelfBack app conducted in Aberdeen, Scotland and Trondheim, Norway [18], where participants also reported a need for the app functionality to improve and a mixed response to the app’s motivational notifications. While most Scottish participants appreciated the notifications they viewed, user reception in Norway was less positive, with only half finding them useful. This pattern of uneven response across locations highlights the need for further refinement of the notification system to ensure it resonates with a broader range of users.

The requirement for mandatory sign-up questions during initial app interaction, though intended to gather information for treatment plan updates, received some negative feedback from participants in this study and may contribute to stress. As initial onboarding experiences can significantly affect app adherence, this step could be streamlined and made more user-friendly to prioritize patient comfort and engagement [19]. Therefore, future versions of the Arabic SelfBack could simplify the sign-up process or clearly communicate its importance in managing patient expectations and prevent negative first impressions. This study’s findings regarding the desire for personal interaction with healthcare professionals concurs with a qualitative study by AlZahrani et al. (2022) [19] who explored Saudi patients’ perspectives on mobile health applications. They found a preference for personal interaction with healthcare providers to

enhance adherence and suggested incorporating social media groups for peer support within an app. These insights may help guide app developers and designers in the future to enhance the app's functionality by reducing repetition, improving interaction with healthcare practitioners, and potentially expanding the exercise variety to better meet users' expectations.

Strengths and Limitations

The strength of this study was the comprehensive and evidence-based method of translating and culturally adapting the English version of the SelfBack app to the Arabic language. The main limitation of this study was the low number of participants included in the field usability testing. Future research to evaluate the effectiveness of the SelfBack app in the Saudi population will be of value.

Conclusions

This study successfully translated, culturally adapted and tested the usability of an Arabic version of the SelfBack app. High user satisfaction, ease of use, efficiency, and minor negative feedback were demonstrated. The Arabic SelfBack app is ready for use in research to test its impact on clinical practice.

Acknowledgements

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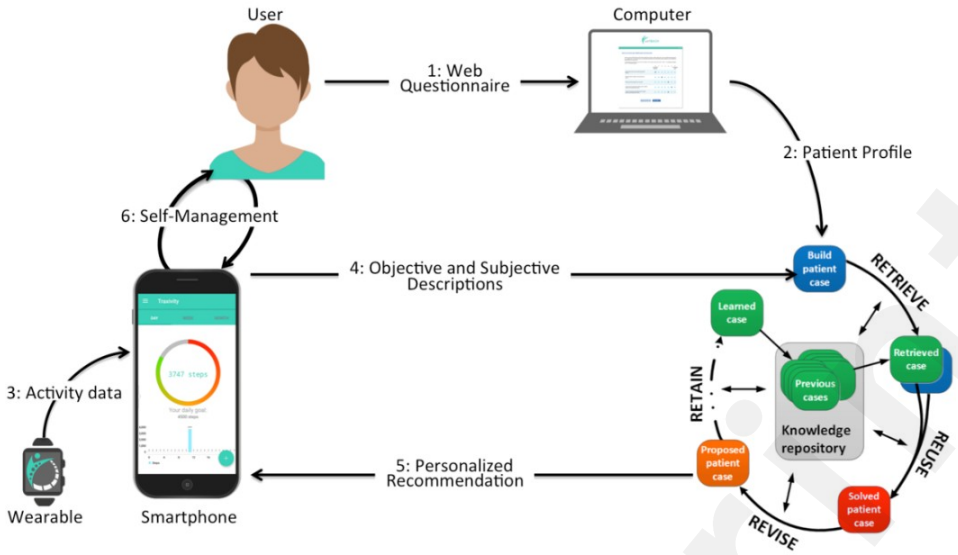
Conflicts of Interest

The authors declare they have no conflict of interest.

Table 1. Demographic data of the 11 participants included in the field usability test. [1]Musculoskeletal Health Questionnaire (MSK-HQ), and [2]Keel StartBack Tool.

Participant	Gender	Age (years)	MSK-HQ[1]	StartBack tool[2]	Physical activity level (Day/week)
1	Female	37	29	High	4
2	Female	40	46	Low	2
3	Female	36	41	Low	0
4	Female	58	43	Medium	2
5	Female	38	35	High	0
6	Female	52	32	Medium	5
7	Female	38	30	High	2
8	Female	38	38	Medium	0
9	Female	31	44	Low	5
10	Female	38	35	Medium	2
11	Male	31	30	Low	2

Figure 1. The SelfBack smartphone app workflow (adapted from the SelfBack website https://www.SelfBack.eu/) 2023.



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Supplementary Files

Figures

The SelfBack smartphone app workflow (adapted from the SelfBack website https://www.SelfBack.eu/) 2023.