

Gujarati translation and adherence testing of Stretching and Strengthening of Rheumatoid Arthritis of the Hand (SARAH)

Divya J. Patel¹, Balaganapathy Muruganatham²

¹Department of Musculoskeletal Sciences, College of Physiotherapy, Sumandeep Vidyapeeth-An Institution Deemed to be University, Vadodara, Gujarat, India, ²Department of Musculoskeletal Sciences, Professor, Ashok and Rita Patel Institute of Physiotherapy, Charotar University of Science and Technology, Changa, Gujarat, India

ABSTRACT

Context: Stretching and strengthening for rheumatoid arthritis of the hand (SARAH) is a progressive and individually designed recommended treatment exercise program. **Aims:** The aim was to translate the SARAH hand exercise program into Gujarati and assess the adherence rate, usefulness, and understanding of the Gujarati SARAH exercise program. **Methods and Materials:** Mixed-method qualitative study was conducted among 25 participants at the outpatient departments of Institute Nadiad and Niruj Rheumatology Clinic, Gujarat, and via professional contact, a telephonic semi-structured interview was conducted among 13 participants using an interview guide, and interviews were audio-recorded following transcription verbatim. Overall adherence rates of 25 participants to a 12-week exercise program were determined using the cross-sectional method. **Statistical Analysis Used:** IBM SPSS software version 23.0 was used for analyzing quantitative data, and NVivo Plus version 11 was used for qualitative data. **Results:** The adherence rate was 97.22%. Participants completed all 72 sessions ($n = 7$) with an adherence rate of 100%. The least number of sessions completed was 25 ($n = 2$), with an adherence rate of 34% due to a lack of interest in exercising on a daily basis. Qualitative findings showed that the booklet is understandable, useful, and beneficial in terms of reducing symptoms and improving activities of daily life as well as occupational work. **Conclusion:** The translated strengthening and stretching for rheumatoid arthritis in the hand exercise booklet is effective and beneficial to patients who exercise at home. Participants can self-track their exercise by using dairy, which eliminates travel costs and attendance at clinic sessions.

Keywords: Exercise adherence, hand exercises, qualitative research, rheumatoid arthritis, SARAH

Introduction

Rheumatoid arthritis (RA) is an autoimmune disease characterized by persistent joint inflammation as well as cartilage and bone damage along with significant limitations in movement.^[1]

Relapse and remissions are its hallmark and persons with RA face personal and social stresses like musculoskeletal pain, poor quality of life, and decrease in their ability to do work.^[2] The disease affects 0.5–1% of the population between the ages of 35 and 55.^[3] It is more common among Indians, with an incidence of 0.75%. In a substantial number of people with RA (81%), there is serious impairment affecting hand function and daily life activities.^[4] Prevalence studies of the districts (Palanpur and Mehsana) showed a rate of 0.06% compared to that of global prevalence (0.5–1%).^[5] Most people never received a clinical diagnosis, remaining untreated for the rest of their lives. NSAIDs are commonly used and 90% of patient's self-treat.^[6]

Address for correspondence: Dr. Divya J. Patel, College of Physiotherapy, Sumandeep Vidyapeeth-An Institution Deemed to be University, Piparia, Vadodara - 391760, Gujarat, India. E-mail: djpatel1298@gmail.com

Received: 04-04-2024

Revised: 09-05-2024

Accepted: 16-05-2024

Published: 18-10-2024

Access this article online

Quick Response Code:



Website:
<http://journals.lww.com/JFMPC>

DOI:
10.4103/jfmpe.jfmpe_559_24

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Patel DJ, Muruganatham B. Gujarati translation and adherence testing of stretching and strengthening of rheumatoid arthritis of the hand (SARAH). J Family Med Prim Care 2024;13:4586-97.

Maintaining exercise adherence is essential to long-term benefits, but it can be difficult and challenging to encourage people with RA to exercise every day.^[7] Short duration has high adherence and long-term and home exercise programs do not have similar adherence.^[8] According to National Institute for Health and Care Excellence (NICE) guidelines (2015), Stretching and Strengthening for Rheumatoid Arthritis of the Hand (SARAH) is the recommended treatment option for RA-affected adults with hand problems.^[9] It consists of seven mobility and four strengthening exercises. It is progressive and individually designed which provides an additional resource for best practices in health care. The SARAH exercise program material was translated in other languages like Hindi, Igbo, Yoruba, Malayalam, Hausa, Odia, Telugu, Tamil, Brazilian-Portuguese, Japanese, Turkish, and Hebrew for rehabilitation. SARAH is cost-effective and widely used exercise program in the United Kingdom for RA hand patients.^[10] The major gap we had identified was that in India, especially in Gujarat, there is no such evidence-based treatment used for the treatment of RA and no evidence is available for using SARAH. In Gujarat state, it is difficult to understand and follow intervention material (program) that is available in English. According to the literature review, there is a lack of information about the SARAH exercise program among patients with RA, due to fewer people doing regular exercises. To increase adherence and utilization of the exercise program needed to translate into the Gujarati language for better understanding. Thus, the aim of the study is a translation of the stretching and strengthening for rheumatoid arthritis of the hand exercise program (SARAH) in Gujarati language for people with rheumatoid arthritis. This could help physicians in guiding their patients toward Physiotherapeutic management, as rheumatoid arthritis requires a multidisciplinary approach that leads to more favorable outcomes.

Material and Methods

Permission to translation was obtained from the developers of the original SARAH exercise material, University of Oxford (<https://www.ndorms.ox.ac.uk/research/research-groups/centre-for-rehabilitation-research-in-oxford/resources/translations-of-sarah-programme-materials>). Study was accepted by the Institutional Ethical Committee of Charotar University of Science and Technology with the

ethical clearance number of IEC/CHARUSAT/21/39. The Consolidated criteria for Reporting Qualitative research (COREQ) checklist has been used for study reporting. Figure 1 shows the translation process of the SARAH exercise material.

Research team and reflexivity

Two researchers with backgrounds in physiotherapy (DP and BM) conducted the study. The Master of Physiotherapy candidate (DP) completed an online e-workshop on using NVivo for data analysis and conducted the interview, while the other author (BM), a professor, principal, doctorate holder, and expert in translational research, ergonomics, and pain management, examined and double-checked the data for accuracy. Participants were aware of the interviewer's name, as well as their profession and the objective of the study. Many participants conversed with the interviewer (DP) between exercise periods and before interviews throughout the 12-week.

Study design

A nonexperimental mixed-method qualitative study design.

Participant selection

Convenience sampling was used to recruit participants from February 7, 2022, to February 28, 2022. Twenty-five female participants were included in the study. They were all housewives—except one who was a receptionist and another one who was a laboratory technician. During recruitment, participants were approached face-to-face. The follow-up course lasted 12 weeks and after 12 weeks participants were approached for the telephone interview. Twenty-five participants were observed and examined for adherence rate, 13 of whom were interviewed. Twenty patients declined to participate in the study as they had only learned the exercise they would practice at home. Some stated that despite completing numerous sessions of physiotherapy, their pain and stiffness remained. Others reported that doing exercise makes their pain worse. Nine people were unable to participate because they were illiterate, and 20 do not have Gujarati language writing and reading abilities.

Setting

Data was collected from the Outpatient departments of Ashok and Rita Patel Institute of Physiotherapy, Niruj

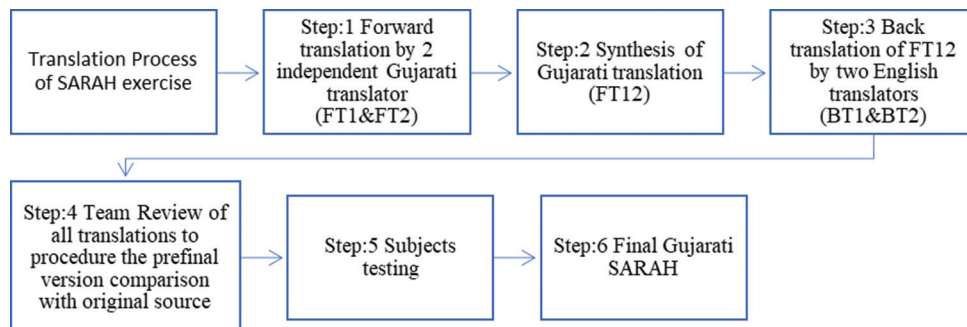


Figure 1: Flowchart of the translation process

Rheumatology Clinic (Maninagar—Gujarat); some were included via professional contact. During the recruitment of the participant, one of the family members and rheumatologist were also present and known about the participant's involvement. Participants were included in the study based on the following eligibility criteria: participants who had been diagnosed by rheumatologist with seropositive RA for more than one to two years,^[11] patients who have a score of 11–15 on the American College of Rheumatology,^[12] person who knows to read Gujarati as they have to use Gujarati exercise booklet at home on regular for 12 weeks of duration, participants who had a previous history of hand surgery or fracture before in the past six months,^[8] age less than 18 years, and patients who were pregnant.^[13] Personal information, such as name, age, gender, occupation, phone number, and duration of illness, was gathered and analyzed using the 2010 American College of Rheumatology (EULAR) RA classification criteria.

Data collection

On the first day of recruitment, the participants were given a thorough explanation of the translated SARAH booklet and a demonstration of the exercises mentioned inside it. The second time, they were asked to perform the exercises with the researcher (therapist) so that they could understand and remember them better. Then randomly, they were asked to demonstrate the exercises, and the researcher observed their performance. All materials needed for the exercises, such as Theraputty (soft resistance and firm resistance), softballs, and Theraband (green and red), were provided to the participants free of charge, and they were told to complete this exercise over a 12-week period on their own at home. During the 12-week period, the researcher or therapist sent them weekly reminders to perform the exercises, and information on symptoms of relapses was collected via phone calls. If the activity was aggravating their symptoms, they were asked to avoid exercise and reduce the number of repetitions of exercise. Repetitions were different for all participants based on the nature of their symptoms and the severity of their disease. The quantitative data for the adherence rate—the number of days they exercised throughout the 12-week period—was collected and analyzed. Pictures of the exercise diary were collected via a social media platform (WhatsApp), and those who did not use WhatsApp were asked to report via telephone calls.

Interview guide

An interview guide was used for the qualitative data, which was adopted from the prior study^[8] [Supplementary Data: 14.5 Appendix V—Interview Guide]. This interview guide

comprised 19 questions, which were divided into four main topics. The interview guide was pilot-tested with two participants to check the difficulties encountered during the interview and whether the participants were able to understand and answer the questions. Pilot-tested interviews were not included in the analysis. An individual semi-structured interview was carried out, and during the interview, some question prompts were provided, and repeated interviews were not conducted. A total of 13 interviews were conducted as it reached data saturation. The same answers were getting, but there were no new themes or details. Individual telephonic interviews were conducted, and interviews were audio recorded. Interviews lasted up to 15–25 minutes, and interviews were taken at participant's convenient time. The interview was translated into Gujarati. All interview transcripts were transcribed verbatim in English, which is the patient's language, according to statements given by participants. Transcripts were checked multiple times to understand and prevent errors. Field notes were maintained during the interview, which included flow and tone of speech during the answer and gestures during interviews like laughing in between, taking a pause, and using emotional words during the answer. Transcripts were not returned to participants for correction because they were unable to read English.

Results

Quantitative data analysis and findings

Demographic data was analyzed with descriptive statistics using IBM SPSS software 23.0, which is shown in Table 1.

A total of 25 participants were analyzed for adherence rate. The total number of sessions in the 12-week period was 72, and participants were asked to exercise daily, except Sunday. Figure 2 illustrates the number of sessions exercised and the percentage of days participants adhered to the exercise program for a 12-week duration.

Overall adherence was found to be 97.22 percent. The maximum number of participants who finished all of the sessions was 72 ($n = 7$ participants), with an adherence rate of 100%. The least number of sessions completed was 25 sessions ($n = 2$ participants), with an adherence rate of 34% due to a lack of interest in exercising on a daily basis. The session's average score was 62.28.

Qualitative data analysis and findings

Data was analyzed using an interpretative phenomenological approach (IPA), which is an effective way to understand how

Table 1: Demographic details of participants with rheumatoid arthritis (n=25)

	Descriptive Statistics of Participants				
	n	Mean±SD	Range	Minimum	Maximum
Age (Years)	25	47.97±10.98	44	27	71
Duration of Disease (Years)	25	6.57±5.60	19.5	0.5	20
For RA, the total score of the 2010 American College of Classification Criteria	25	8.66±1.60	6	7	13

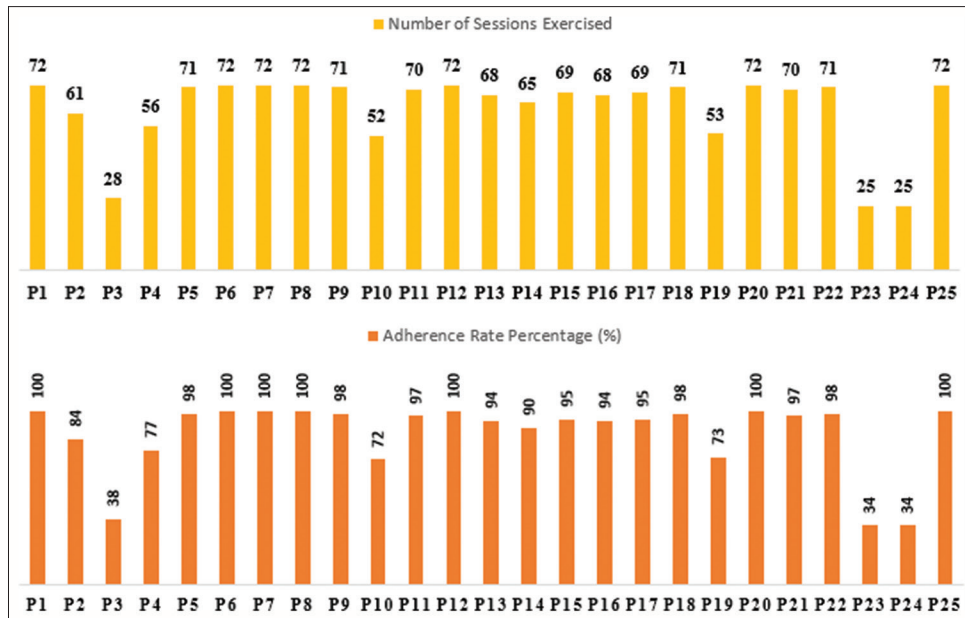


Figure 2: Number of sessions exercised and participants adherence rate of the 12-week SARAH exercise program (n = 25)

people experience their circumstances, events, experiences, and feelings on an individual basis.^[14] To investigate interesting, unclear concepts or phrases, an IPA technique was applied. QSR, NVivo Plus version 11, a qualitative data management software program, was used to analyze all transcripts. Initially, nine interviews were used to construct preliminary codes, and sections of data were examined. The research guide also addressed and checked codes. Following the preliminary codes from nine interviews, other interviews were conducted, for a total of 13 interviews.

Topic: 1 Living with Rheumatoid arthritis

When compared to the normal population, participants with RA perceived a lower quality of life in various domains, including physical health, independence level, surroundings, and personal views. Figure 3 shows the themes and identified themes of topic 1 living with RA and topic 2 exercising with RA.

Many interviewees expressed their feelings regarding how RA has impacted their quality of life because of their symptoms:

“...having difficulties doing many household chores... I am unable to complete my work quickly due to hand and finger pain... was not able to do all the work efficiently...body does not feel energetic...Life has been severely impacted by RA. unable to lift a pencil, bend my finger or thumb... changed my whole routine in everything... unable to do work at a fast pace... Interest and enthusiasm decreased...”

One of the participants stated that she needed assistance in grooming activities as well as to become dependent on carrying out daily activities due to a decrease in hand function.

“...used to call my neighbor to help me wear a saree... I have to wait for someone to get free so they can take me to the market or shop... I have to ask anyone to make dough. I have to ask someone for help in combing my hair...”

Persons with RA have been found to suffer significantly from psychological aspects because they become dependent on others, are unable to take part in social or activity gatherings, are unable to engage in leisure activities, and are unable to complete even the most basic household task.

“...It’s terrible that you have to listen from all directions... I don’t want to go anywhere, and my mood is becoming agitated... depressed for around 5–6 months...I didn’t talk to anyone and cried all the time...dislike talking to others and going anywhere... disagreements with my husband... has developed into a state of tension... Interpersonal relationships affected with husband and in-laws...”

In sentiment analysis, 3–4 individuals expressed positive feelings and talked about the different ways they would live if they did not have RA. They reported that they could be independent in terms of physical activity and ADLs. Without depending on others, they can socialize and have fun.

“...No medicines; even my income gets saved... Enjoy yourself and travel wherever you want... Life would be fantastic... Spend time with everyone more happily... It would be super... You don’t have to tell anyone that you have to do this to me... able to do all the household chores well...”

Topic: 2 Exercising with RA

It was obvious that developing a routine and prioritizing exercise was crucial for finishing exercise successfully. Based on the responses of the respondents, the following two subthemes were recognized as shown in Figure 3.

Some of the participants stated that including exercise in their daily routine is beneficial in terms of developing habits and showed interest in continuing the exercise in the future.

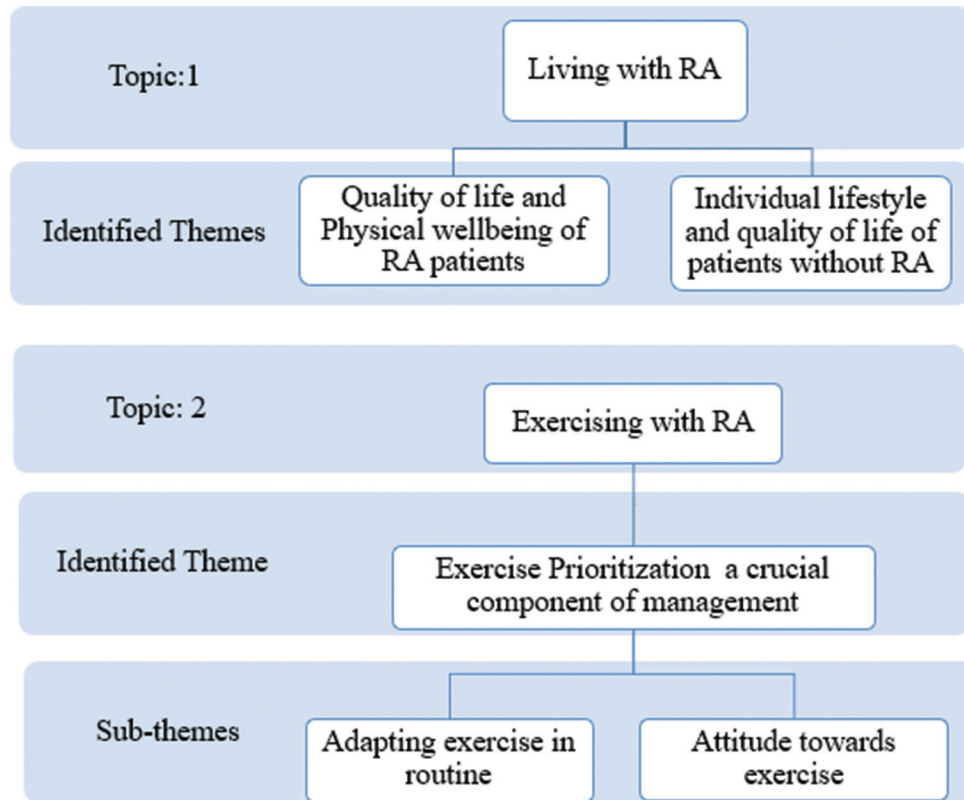


Figure 3: Identified themes and subthemes of topic 1 and topic 2

“...Exercise first, then work... It has now become routine work for me... feel that repeating it over a longer period of time would be more beneficial... Initially, 5 reps were painful, but it has now become routine for me...”

Topic: 3 Participant experience of the SARAH exercise program

The themes and subthemes that participants in the SARAH exercise program identified are shown in Figure 4 and are explained below.

Barriers

Exercise has been observed to be hampered by internal disease-related barriers, such as decreased mobility and stiffness. One of the most common barriers to regular leisure, physical activities, and exercise was caused by rheumatoid arthritis, according to almost all of the participants.

“...The pain was excruciating... If it gets stiff and difficult to manage... Pain occurs more at night, which is unable to let us sleep and awake... Pain in arthritis is such that sometimes people get irritated... I cannot work instantly after waking up in the morning...”

The study’s environmental or external barriers were those that make it difficult for participants to maintain their exercise regimen. According to interviewees, the biggest barrier to finishing the SARAH exercises was having conflicting interests and being preoccupied on family responsibilities, housework, and social activities:

“...Workload and timing are the only reasons that make it difficult... have a lot of social and household responsibilities... The atmosphere at home was disturbed, and I had to go somewhere...difficult to manage with kids...”

Social media and YouTube were identified as external barriers that negatively influenced participants, leading them to follow a variety of activities without knowing which were appropriate.

“...I watched many videos of exercises...Do exercises by watching on YouTube...”

Other types of treatment were also recognized as barriers and participants said they have a higher chance of experiencing reversible symptoms like increasing pain, flaring up, stiffness, and mobility restrictions.

“...ayurvedic proved to be very dangerous for me...swell and the aches worsen with ayurvedic treatment...consulted many orthopedics but not got relieved and got tied...done a lot of indigenous medicines...used many home remedies but condition got worsen...”

One participant highlighted the environment, which was also noted as a barrier, and the way it affects symptoms.

“...Life is dependent on weather...Symptoms vary from weather to weather...At the time of rain and winter, more stiffness we get...”

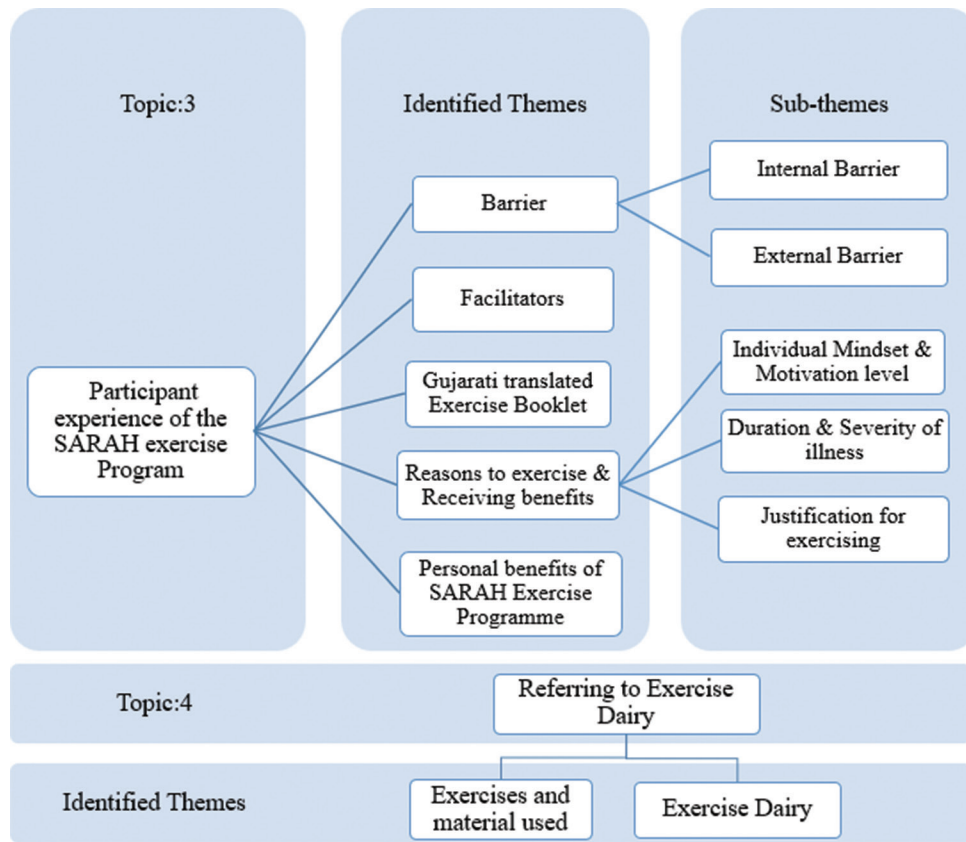


Figure 4: Identified themes and subthemes of topic 3 and topic 4

Barriers were assessed to understand the harm during exercises. There are no harms linked with SARAH exercises, according to the majority of participants in this 12-week exercise program.

Facilitators

A crucial facilitator is the guidance of medical specialists such as physiotherapists and rheumatologists, in addition to friends and family:

“...My husband advises me to exercise on a daily basis...doctor also said that it is good for you... You showed me face-to-face practically, so I remembered...My daughter’s child is a physical therapist; she also advised me to continue exercising...”

It was shown that psychological factors and perception toward exercise served as facilitators for some of the participants.

“...In the beginning, while exercising, pain occurs, but it gets better after the exercise...Medicine has little effect; the main focus is on yoga and exercise... Exercise improves your quality of life...”

Gujarati translated exercise booklet

Participants reported that the SARAH booklet was useful for the following exercises:

“...book is good...All exercises are understandable...The wording of the booklet is also understandable and simple...completed exercises properly by reading and looking at pictures...”

Reasons to exercise and receiving benefits

The participants discussed about the reasons behind their benefit from the 12-week regimen and other subthemes that emerged from the discussion, such as the fact that various individuals respond differently to different types of exercise and medications. The subthemes are shown in Figure 4. During the interview, the interviewee conveyed their thoughts and emotions about their motivation for exercising:

“...I used to encourage and make everyone do exercise... Some of them feel bored, as if they are tied to life...Exercise can be helpful, but sometimes for me, it’s like “me time or leisure time”... I exercise because nothing harmful happens to me...Regular exercise along with medicines has more benefits...”

The duration and severity of the illness have been identified as key factors for RA patients. Early detection of the condition and regular exercise are beneficial and may have long-term effects. Some might not benefit from exercise because they cannot move even a single joint due to swelling and pain.

“...Sometime unbearable and extremely painful... Swelling prevents me from exercising regularly... hands get numb and unable to lift or move hands and fingers...Sometimes it seems that the benefit is not happening... Pain increases so much that medicine has to be taken...”

Most of them require prior knowledge and exercise motivation that could be useful in an exercise program. However, if

individuals have no motivation to exercise and would rather take medication, lie in bed, and relax all day than exercise, assistance may not be effective.

"...I will continue to exercise even in the future because I have so much relief from the exercise... Now I have to do it on my own to get a grip on exercising... I exercise for myself... Feel happy and relax all day... Exercise keeps muscles and the body healthy and gives energy... I am happy, and I do all exercises with pleasure..."

Personal benefits of stretching and strengthening for rheumatoid arthritis of the hand exercise program (SARAH)

The SARAH exercise was beneficial to 13 of the interviewees. From that, two of them stated that allopathy and exercise led to a faster and more effective cure. As a result of improved hand function, they said that their daily activities have led to improvement:

"...pain reduced and muscle stiffness reduced... Exercises are very important for mild pain. Exercise daily reduces stiffness and leads to free movement... The overall exercise program was good; all of the exercises were beneficial for housework... Now I can flex my fingers and make a fist without pain. Now I used to work easily... My hands felt good after the exercise..."

Some jobs necessitate the use of one's hands for a variety of tasks, such as writing and typing. This exercise program has benefited the workplace a lot, according to one of the participants. "... My occupation is receptionist, so I require writing work, so hand exercises were good and helpful for me..."

Many of them expressed enthusiasm for the benefits of the SARAH exercise program after completing 12 weeks: "...I am happy with this program... I got my expectation, and it feels good..." Two of the participants do not exercise on a regular basis and avoid exercise owing to increased flare-ups and severe RA episodes of pain; hence, no benefits were observed in them.

Topic: 4 Referring to exercise dairy Exercise dairy

Exercise dairy is a strategy to ensure participants exercise at home since they are aware that they must keep track of their progress and report it to their therapist. The identified themes from referring to exercise dairy are shown in Figure 4.

Several interviewees expressed positive aspects, saying that it is a great way to keep records up-to-date and reminds them to exercise.

"...helped me to recall that I had performed these many exercises... We realize that these many days we exercised, and this much I have lost... helpful for our record. It reminds me to do exercise... helped to do exercise daily... Looking at the dairy, I feel like I have to do something..."

According to sentiment analysis, two people had said that they had negative feelings about exercise and dairy: "...I need to take

care of that dairy... It can be lost or spoiled... I have other duties, like with small kids, and it is difficult for me to tick every day..."

Exercises and material used

Interviewees said that the exercises were easy, understandable, and easy to perform. More remarks were made on the materials that were given to the participants, which included a ball, Theraputty, and Theraband.

Ball exercise was found to be beneficial and enjoyable for most of the participants: "...The best is ball exercise... Ball exercises are something that I enjoy doing... lot of fun with the ball exercise, and it gave me a lot of relaxation in my fingers... With ball exercise, the circulation in the palm of the hand remains good and relaxing..."

Some of the participants dislike putty and Theraband exercises, so they sometimes skip this exercise, while others have benefited from and completed them:

"...I don't like putty exercise... I found it a bit strange... Putty exercise had more benefits for me... feels good on the finger... Putty pressing is good as well as helpful in the work we do in the kitchen... I dislike Theraband exercises as they cause me more pain..."

Some participants showed positive sentiments that they have enjoyed and well received the Theraband, ball, and putty exercises, which can be done at any place and time.

"...At present, it is very easy and a bit speedy... Putty exercise had more benefits for me... It feels like we are preparing dough, so I feel that it is beneficial... Materials are good and useful... material was helpful to me; I felt a difference in stiffness and got relief from it... doing finger basic exercises while walking, standing, and traveling..."

Discussion

The major aim of this study was to translate the SARAH exercise program into Gujarati because, in Gujarat, not everyone can read and use English. After the translation, a booklet was created and distributed to the participants to use for a period of 12 weeks to determine the exercise program's adherence rate as well as the utility and understanding of Gujarati SARAH. Through quantitative data, we discovered an overall 97% adherence rate for the 12-week SARAH exercise program. According to qualitative data, the Gujarati SARAH booklet was easily understood by participants, and they were able to complete and follow exercises using it on their own at home.

Susan *et al.* reported in a qualitative study that exercise adherence can be increased by reducing patients' stress by increasing frequent contact with them.^[15,16] In this study, patients were contacted and called weekly via telephone, and we talked with them about the exercises and any difficulties they found during exercising. Their problems were also solved, and suggestions were provided to manage pain. Participants were aware that they must exercise on a regular basis and needed to respond to the

questions at the end of the 12-week period. This could be one of the reasons why our study found a higher-than-predicted rate of home exercise adherence. In addition to this, we recommended a few stress-reduction techniques, encouraged them to be active rather than lying in bed, and suggested they engage themselves in some leisure or spiritual activities as per their interests.

All of the participants stated that the exercise met their expectations and benefited their daily activities. It was found to be less time-consuming, taking only 15–20 minutes to complete, so they can do it regularly, and they stated in an interview that they will recommend it to other people suffering from RA. When the data were compared to those of other studies, it was shown that participants had some knowledge and awareness about the benefits of exercise.^[17,18] However, in our study, participants had never heard of the SARAH exercise.

We discovered that rheumatologists, other healthcare specialists, and physiotherapists had a good attitude toward regular exercise and agreed that exercise is necessary and beneficial for RA patients these findings also correspond to one of the prior studies.^[19] Almost all patients and rheumatologists were unaware of the SARAH exercise program and that this type of evidence-based therapy exists.

According to prior research, the barriers to exercise are the same for patients who have specific disease symptoms such as pain and stiffness.^[19,20] In our research, we discovered that pain is the most prevalent internal barrier that prevents patients from doing exercises on a daily basis.

Strengthening exercises can enhance grip strength in RA patients with abnormalities of the hand, as well as improve functional ability and reduce limitations that they have during their daily activities.^[21,22] Similarly, there are strengthening exercises that are performed with the use of materials that have shown improvements in grasping and other hand-functioning activities in our study. From many interviews, we identified that some of the exercises are difficult for patients in the initial phase, which are Theraband and Theraputty exercises, and it takes more time to get used to them.

In an interview, one of the participants stated that pharmacological and other treatments are more expensive. Half of one's income is spent on them, which causes a financial burden. Similarly, this life-long illness may affect the economic state of both patient and family member, which is depending on the severity of the disease, resulting in a rise in extra costs for patients and other family members.^[23,24]

Effective multidisciplinary collaboration between physiotherapists and primary care physicians is necessary to combat this problem, enhance quality of life, and preserve the strength and flexibility of the muscles and mobility of joints in rheumatoid arthritis

patients. Patients need to be advised of the importance of including exercise into their daily routine.

In this mixed-method qualitative study, many participants had adapted exercise as a routine for self-care and to improve their quality of life. The exercise diary was handed to participants to keep for three months, and they were asked to send images or report the number of sessions they exercised to the therapist via phone call on a weekly basis. This was one of the strategies employed in our study to get them to exercise at home. Furthermore, this study has the advantage of contacting participants via phone, which may allow for more honest responses than face-to-face interviews or focus groups may provide.

Limitations

Although everyone was able to participate in this study, only women expressed interest and participated. They can tick in the exercise diary even if they do not finish the exercises. To fully explore RA and exercise, more participants may be required. A flaw in the methodology was that the researcher who recruited the participants had conversations with them in interviews to gain information about their experiences. Despite all of its limitations, interviews and feedback from participants indicate that the SARAH program is safe and beneficial, making it suitable for use in our community for rehabilitation. It is good that no studies in Gujarat focused on this exercise program as it lays the groundwork for such studies in the future.

Future recommendations

To help individuals perform things more effectively, a Gujarati SARAH smartphone application that includes audio, video, and photographs in Gujarati can be developed. RCTs with smart goals and particular outcome measures can also be carried out within the Gujarati population.

Conclusions

The Gujarati population can use this translated Gujarati strengthening and stretching for rheumatoid arthritis of the hand (SARAH) exercise booklet. It is effective and beneficial to patients who exercise at home. Participants can self-track their exercise by using diary. It also eliminates travelling costs and attendance at clinic sessions as people do at home by using a booklet.

List of abbreviations

RA: Rheumatoid arthritis
 NICE: National Institute for Health and Care Excellence
 SARAH: Stretching and Strengthening for Rheumatoid Arthritis of the Hand
 IPA: Interpretative Phenomenological Approach
 FT1: Forward translation one
 FT2: Forward translation two

BT1: Back translation one
 BT2: Back translation two
 EULAR: European Alliance of Associations for Rheumatology
 QSR: Qualitative research software.

Acknowledgements

The authors would like to thank Dr. Cynthia Srikesavan for granting permission for translation, for providing valuable suggestions throughout the research process, and for preparing the manuscript. We are grateful to all the translators Dr. Sweni Shah (PT), Dr. Heta Patel (PT), Dr. Lipi Acharya and Dr. Jogeshkumar Purohit, Dr. Rajvi Shah (PT), Dr. Simran Chhotala (PT) for helping in developing Gujarati SARAH booklet. Thanks are due to rheumatologist, Dr. Anuj Shukla, for permitting to collect data from his clinic and to participants for participation and giving their valuable time.

Contribution details

Contributor 1: Concepts, Design, Definition of intellectual content, Investigation/Data collection, manuscript writing

Contributor 2: Concepts, Design, Definition of intellectual content, Manuscript writing guidance, Verification of manuscript.

Ethical Policy and Institutional Review Board statement

The Ethics Committee of the Institute (IEC/CHARUSAT/21/39) approved the study. The permission to collect data was obtained from rheumatologist to collect data from his clinic.

Patient declaration of consent statement

Participants were informed about the study using a participant information sheet and had them sign an informed consent form to participate on a voluntary basis.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Kumar AA, Gupta K, S K, Kumar SA. Clinical profile of rheumatoid arthritis patients reporting to a tertiary care center - Data from Southwestern Part of India. 2019. Available from: <http://imsear.searo.who.int/handle/123456789/202428>. [Last accessed on 2023 Jan 04].
2. Shinde SB, Varadharajulu G. Effect of therapeutic exercise programme in adults with early rheumatoid arthritis. *Indian J Physiother Occup Ther* 2017;11:76-80.
3. Patel MM. An epidemiological survey of arthritis in the population of north Gujarat, India. *Int J Pharm Sci Res* 2011;2:325.
4. Arab Alkabeya H, Hughes AM, Adams J. Factors associated with hand and upper arm functional disability in people with rheumatoid arthritis: A systematic review. *Arthritis Care Res* 2019;71:1473-81.
5. Safiri S, Kolahi AA, Hoy D, Smith E, Bettampadi D, Mansournia MA, *et al*. Global, regional and national burden of rheumatoid arthritis 1990-2017: A systematic analysis of the Global Burden of Disease study 2017. *Ann Rheum Dis* 2019;78:1463-71.
6. B PK, M SM, K R, VN N, PSM. Epidemiology of autoimmune disorders with special reference to rheumatoid arthritis from a tertiary care center. *Indian J Pharm Pract* 2014;7:50-60.
7. Nichols VP, Williamson E, Toye F, Lamb SE. A longitudinal, qualitative study exploring sustained adherence to a hand exercise programme for rheumatoid arthritis evaluated in the SARAH trial. *Disabil Rehabil* 2017;39:1856-63.
8. Williams MA, Williamson EM, Heine PJ, Nichols V, Glover MJ, Dritsaki M, *et al*. Strengthening and stretching for rheumatoid arthritis of the hand (SARAH). A randomised controlled trial and economic evaluation. *Health Technol Assess Winch Engl* 2015;19:1-222.
9. Overview. Rheumatoid arthritis in adults: Management. Guidance. NICE. NICE; 2020. Available from: <https://www.nice.org.uk/guidance/ng100>. [Last accessed on 2023 Jan 04].
10. Sarah Trial Team; Adams J, Bridle C, Dosanjh S, Heine P, Lamb SE, *et al*. Strengthening and stretching for rheumatoid arthritis of the hand (SARAH): Design of a randomised controlled trial of a hand and upper limb exercise intervention--ISRCTN89936343. *BMC Musculoskelet Disord* 2012;13:230.
11. Rodriguez-Sánchez-Laulhé P, Luque-Romero LG, Blanquero J, Suero-Pineda A, Biscarri-Carbonero Á, Barrero-García FJ, *et al*. A mobile app using therapeutic exercise and education for self-management in patients with hand rheumatoid arthritis: A randomized controlled trial protocol. *Trials* 2020;21:777.
12. Wasserman AM. Diagnosis and management of rheumatoid arthritis. *Am Fam Physician* 2011;84:1245-52.
13. Williams MA, Srikesavan C, Heine PJ, Bruce J, Brosseau L, Hoxey-Thomas N, *et al*. Exercise for rheumatoid arthritis of the hand. *Cochrane Database Syst Rev* 2018;7:CD003832.
14. Alase A. The Interpretative Phenomenological Analysis (IPA): A guide to a good qualitative research approach. *Int J Educ Lit Stud* 2017;5:9-19.
15. Baxter S, Smith C, Treharne G, Stebbings S, Hale L. What are the perceived barriers, facilitators and attitudes to exercise for women with rheumatoid arthritis? A qualitative study. *Disabil Rehabil* 2016;38:773-80.
16. Holt CJ, McKay CD, Truong LK, Le CY, Gross DP, Whittaker JL. Sticking to it: A Scoping review of adherence to exercise therapy interventions in children and adolescents with musculoskeletal conditions. *J Orthop Sports Phys Ther* 2020;50:503-15.
17. Law RJ, Breslin A, Oliver EJ, Mawn L, Markland DA, Maddison P, *et al*. Perceptions of the effects of exercise on joint health in rheumatoid arthritis patients. *Rheumatol Oxf Engl* 2010;49:2444-51.
18. Halls S, Law RJ, Jones JG, Markland DA, Maddison PJ, Thom JM. Health professionals' perceptions of the effects of exercise on joint health in rheumatoid arthritis patients. *Musculoskeletal Care* 2017;15:196-209.
19. Veldhuijzen van Zanten JJCS, Rouse PC, Hale ED,

- Ntoumanis N, Metsios GS, Duda JL, *et al.* Perceived barriers, facilitators and benefits for regular physical activity and exercise in patients with rheumatoid arthritis: A review of the literature. *Sports Med Auckl NZ* 2015;45:1401-12.
20. Canning J, Williams R, de Souza S. Patient experiences of physical activity and exercise in rheumatoid arthritis. *Rheumatol Adv Pract* 2023;7:rkac098. doi: 10.1093/rap/rkac098.
 21. Cima SR, Barone A, Porto JM, De Abreu DCC. Strengthening exercises to improve hand strength and functionality in rheumatoid arthritis with hand deformities: A randomized, controlled trial. *Rheumatol Int* 2013;33:725-32.
 22. Hall AM, Copsey B, Williams M, Srikesavan C, Lamb SE; Sarah Trial Team. Mediating effect of changes in hand impairments on hand function in patients with rheumatoid arthritis: Exploring the mechanisms of an effective exercise program. *Arthritis Care Res* 2017;69:982-8.
 23. Taylor PC, Moore A, Vasilescu R, Alvir J, Tarallo M. A structured literature review of the burden of illness and unmet needs in patients with rheumatoid arthritis: A current perspective. *Rheumatol Int* 2016;36:685-95.
 24. Kavanaugh A. Economic consequences of established rheumatoid arthritis and its treatment. *Rheumatol Int* 2007;21:929-42.

14.5 Appendix V- Interview Guide

Patient number:

Date:

venue:

Topic: Living with RA

1. Can you tell me about the history of your RA?
2. How has having RA affected your life?
3. How your life be different if you did not have RA
4. Have you found ways that you can improve or control the symptoms of your RA? Can you give me some examples? What would you advise someone else with RA to do help their symptoms?
5. What treatments have you tried before? What effect did they have on your symptoms?
6. Is there any other treatment that you feel would you feel would be benefit for you? If so, can you give me some examples?

Topic: Exercising with RA

1. Patients with RA are often told to exercise regularly. How do you feel about this exercise?
2. Can you tell me some of the reasons that you do exercises/Do not do any exercises?
3. Can you tell me some of treatment you remember doing?

4. What advice would you give someone with RA about doing Exercise?
5. Has your attitude to exercise changes since taking part in SARAH trial? If so, how has it changes?

Topic: Participant experience of the SARAH trial

1. How did your expectation match up with your experiences of taking part in the exercise?
2. What did you think of the exercise programme?
3. Was there anything that helped you to do exercise regularly? What was it?
4. Was there anything that made it difficult for you to do exercises regularly?

What was if yes:

Why are you still doing them?

How often are you doing them?

Is there anything that you have changes about the way do the exercise...

Prompt e.g. Are you doing then in the same place/time as you did before?

If no: Can you tell me why you decided not to continue the exercise?

Topic: Referring to personal exercise guide and Exercise Dairy

You were also asked to complete an exercise dairy? What did you think on this? Would you change anything about the dairy?

The reason we got you to complete the personal exercise guide and the exercise dairy was that we hoped that it would help you to do your exercise regularly? In what way did they help?

Have you managed to continue with any of these since finishing with the therapist?

What did you think of the materials provided as a part of the exercise programme?