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ORIGINAL REPORT

DEVELOPMENT OF A SUPERVISED EXERCISE PROGRAMME FOR IMMIGRANT WOMEN: FEASIBILITY STUDY OF A PRACTICAL INTERVENTION IN A PHYSIOTHERAPY SETTING

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Background: **While Denmark is facing growing inequality between Danish women and immigrant women in relation to exercise and health, research on interventions and targeted exercise programmes is limited. This study aimed to test the feasibility of a physiotherapeutic supervised exercise programme for immigrant women.**
Methods: **Inspired by improvement research a programme was developed in cooperation with the immigrant women. The intervention was modified continuously according to the women's wishes and needs.**
Intervention: **Baseline focus-group interviews, completion of questionnaire and physical-strength tests, was followed by a 12-week supervised training period. After completion of the training the participants were re-interviewed and re-tested.**
Results: **Twenty-nine women were recruited to the training programme, and 10 attended follow-up. Mean body mass index was 34 kg/m². Attendance rate among follow-up tested participants was 70%. The women gained knowledge about their bodies, a healthier lifestyle, and awareness of the importance of active living.**
Conclusion: **It was possible to recruit and maintain immigrant women in the exercise programme. This study demonstrated the importance of involving the women in the process, and revealed important factors, such as privacy, a local setting and trust in the physiotherapists.**

Key words: exercise; wellbeing; immigrant women; supervised training.

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LAY ABSTRACT

While Denmark is facing growing inequality between Danish women and immigrant women in relation to exercise and health, research on interventions and targeted exercise programmes is limited. This study tested the usefulness of a physiotherapeutic exercise programme developed in cooperation with immigrant women based on interviews. The intervention was modified continuously according to the women's wishes and needs. A total of 29 women were included. Attendance rate among follow-up tested participants was 70%. The women gained knowledge about their bodies, a healthier lifestyle, and awareness of the importance of active living. It was possible to recruit and maintain immigrant women in the exercise programme. The study demonstrated the importance of involving the women in the process and revealed important factors for successful execution of the intervention.

Ethnic minorities can often be difficult to reach for health services that provide preventive care, such as physical exercise training (1). Women from ethnic backgrounds are increasingly experiencing mental and physical health problems, and social vulnerability is a common problem among this group (1).

The term "immigrant" is defined as "A person who has come to a different country in order to live there permanently" (2). In the current study the term is used to describe the participants. Although this is a broad term, it is the most fitting in this context, as the study includes a group of participants originating from various countries, primarily in North Africa, but also Asia and Eastern Europe, who were a mixture of refugees and migrants and who had resided in Denmark for various lengths of time. The term "immigrant" is also used in similar research articles.

The National Institute of Public Health at the University of Southern Denmark notes that immigrant women more often have multiple chronic diseases, such as diabetes mellitus type 2 (DM2) or chronic obstructive pulmonary disease (COPD), than to Danish women. Furthermore, women from ethnic backgrounds who have immigrated to Denmark are usually exposed to stress and social isolation, factors associated with the process of integration into a new society (3). A 2012 national survey showed that 63% of Danish women perform physical exercise several times per week, while only 36% of women of other ethnicities are physically active (4). While Denmark is facing growing inequality between Danish women and immigrant women in relation to exercise and health, research on interventions and targeted exercise programmes for immigrant women are generally limited, despite the increasing relevance (5).

Eskildsen et al. (6) state that the development and implementation of existing exercising programmes

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and interventions targeted at ethnic-minority health in Danish municipalities, regions, and private organizations have generally been operated on a voluntary basis, and partly lack documentation and evaluation (6). Few research projects showing positive results of physical exercise training offered to immigrant women have been conducted. International studies have indicated positive results on various health parameters (7–8), acceptability and compliance (8–9), although the ethnic and medical profiles of participants differ. A Danish intervention project supported by the Rockwool Foundation focused on physical exercise for immigrant women (10). The results showed that, after adopting a physical exercise programme, the women experienced a healthier lifestyle, less pain, and increased wellbeing, as well as improved sleep, increased energy, and healthier eating habits (10). Apart from sporadic voluntary efforts, no programmes targeting prevention and wellbeing based on physiotherapy are available for women of ethnic backgrounds in Denmark. While there are programmes such as "women only Zumba", these have difficulties including women with physical impairments and pain, because volunteers without sufficient health education run most of the programmes. This makes it difficult to offer evidence-based physical training or to ensure individual monitoring.

The aim of this study is to assess the feasibility of a physiotherapeutic exercise programme tailored to immigrant women, by involving the women in the development of the programme. This could lead the way for a larger scale study assessing the effects of exercise on health benefits, physical and psychological wellbeing, and motivate a healthier lifestyle for immigrant women.

METHODS

Study design

To test the feasibility of the developed exercise programme, the study design was motivated by improvement research, in which development, testing, evaluating, and adjusting are closely linked (11). To ensure the target group felt ownership and genuine active participation, they were included in the planning process of the physical training from inception, based on principles about co-creating health services (12). Due to the exploratory approach, we recruited as many women as possible, and therefore did not use any sample size calculation. Trial registration: ISRCTN registry, ISRCTN15851573 on 24 April 2019 retrospectively.

Development of the exercise programme

Prior to the programme planning, in December 2017, 1 of the researchers conducted focus-group interviews with 10 of the participating women. Focus-group interviews were chosen, as this is a good way to explore new concepts (13). The women expressed that they felt there is a lack of programmes that focus on or consider the physical and mental barriers like different diseases or injuries of immigrant women. In addition, the women had several specific wishes regarding the setting and content of the programme, which were taken into consideration in the execution of the programme.

Recruitment and inclusion criteria

The women were primarily recruited through social workers in 2 social-housing areas, and through the chairperson of a local Somali cultural association. Flyers were distributed from the social worker's office, the cultural association's clubhouse, general practitioners' waiting rooms, and a clinic for immigrant people. Immigrant women from the 2 social-housing areas were invited to information meetings, as these 2 social-housing areas were interested in participating. To be included in the study, the women had to have an ethnic background other than Danish, and had to have migrated from their country of origin and now reside in Denmark. According to the office of Employment and Social Administration, women from non-western countries of age over 30 years account for 25% of the unemployed population in the third largest municipality in Denmark (14). Therefore, the minimum age was set at 30 years. The study included women who it was considered would benefit most from increased physical movement in their everyday lives. Exclusion criteria were age under 30 years, and if the women were currently undergoing medical examination for serious illness, where exercising might be contraindicative. The women who attended the meetings were invited to participate in the study. If they consented verbally they were asked to complete a consent form. Consenting women were further invited to participate in the exploratory/developing focus-group interview.

Programme setting and execution

The study was conducted by physiotherapists from a private physiotherapy clinic in primary care. Based on the women's focus-group statements, the programme was carried out in 2 local areas that were readily accessible to the women participating in the study. The training was held twice per week for a period of 12 weeks. For Group 1, the exercise programme was conducted in a Somali cultural clubhouse in their local area, with facilities for the use of yoga mats and elastic bands. For Group 2, the exercise programme was conducted in a small gymnasium located in the basement of their housing area. This location has facilities for cardio machines, yoga mats, elastic bands and dumbbells. Both groups were offered privacy through closed curtains, locked doors, and the assurance of undisturbedness. There was no video surveillance or photography during the training. This allowed the women to be free to remove clothing and/or headscarves.

To support cultural and language integration, the training was conducted in Danish. Not everyone spoke or understood Danish, but the younger women helped translate, thus enabling the exercise training to be conducted in Danish.

In pre-intervention focus-group interview some of the women mentioned self-payment as a motivational factor for attending exercise class. A punch card system for a symbolic amount of DKK150 was used for the programme. At the end of the exercise training programme, participants were awarded sponsored joint training jerseys, and diplomas for participation.

Intervention

The physical exercises consisted of a mixture of endurance, strength, coordination, balance, and resistance training, often including exercises for specific body parts requested by the

Table I. Content of the training sessions

Weeks	Intervention	Plan
1–4	Knowledge about exercising, muscle pain, movement and the body's reaction to exercising. Basic knowledge about pelvic floor, core muscles and breathing exercises. Introduction to simple exercises for the main muscle groups based on Pilates and yoga. Cardio training based on simple aerobics without jumping.	Visually, illustrations of muscles, basic exercises on mats, verbal instructions supported by demonstration of the single exercises
5–8	More advanced balance exercises, guided exercises for especially core and pelvic floor muscles, group exercises and competitions, cardio as Zumba and step exercises. We introduced music to the training sessions.	Demonstration, music for motivation and fun factor. One session of nutrition counselling
9–12	Two and two exercises for strength and cardio, core muscles training and neck and shoulder exercises. More advanced training with a variety of different equipment, for example elastic bands and weights.	Elastic bands and other equipment for motivation and introduction to other training possibilities, demonstration as well as our participation

women. The prioritization of these training types was based on the wishes of the participants, physiotherapeutic knowledge and evidence-based guidelines to exercise in chronic diseases (15). Exercises for weight loss, flat bellies, and reduced pain levels had the highest priority. Most women had no or little experience in physical training, and therefore the training was usually of low-level intensity with many repetitions. Table I shows the content of the training sessions for Group 1 and 2, grouped into 4-week periods.

Data collection

Qualitative and quantitative data were collected to develop and monitor the programme. Before the development of the programme in December 2017, focus-group interviews were conducted by 1 of the researchers to obtain information on the attending 10 participants' expectations and goals in relation to their participation. After completion of the programme, all 29 participating women were invited to an evaluating focus-group interview in April 2018; 9 accepted. Two independent physiotherapists conducted the follow-up interviews based on statements from the previous interviews at baseline. The interviews were recorded on smartphones, transcribed and anonymized by an independent assistant.

Informal observational data was collected in computer notes by the researchers during or immediately after the exercise sessions of the 12-week programme to maintain awareness about whether modification to the content or the interaction with the participants was needed.

Demographic characteristics (family status, age, years of residence in Denmark, and employment status) were collected at baseline. European Quality of Life-5 Dimensions (EQ-5D) was collected at baseline and at the end of the programme (16). EQ-5D was selected as it is a generic measure for health-related quality of life, which is easily and quickly carried out, and the scale is validated in Danish (17). The withdrawal rate was calculated based on attendance registration. Measure of body mass index (BMI), fat percentage, and physical testing through the 6-minute walk test (6MWT) and the sit-to-stand (STS) test (18, 19) were conducted at baseline and after completion of the programme. Fig. 1 presents a flowchart of the process of the project.

Ethics approval and informed consent

Participation was based on informed consent. The participating women received and completed written informed consent with translating help. All participants received written and verbal information about the study. The women could withdraw their consent at any time. The study was accepted by the Danish Data Protection Agency with the number: J.nr. 2017-41-5197. All rules of storage of personal information have been met according to the Danish Data Protection Agency. Data management will be conducted according to the regional rules for data management and protection of the Region of Southern Denmark. Data will only be reported in anonymous form. The dataset will be used only for this project.

Analysis

Analysis from the transcribed interviews, identified areas of importance. Meaningful paragraphs were categorized and translated into factors important to the participants inspired by immersion/crystallization analysis (20).

Two authors who separately read and coded the transcript analysed the evaluating interviews, and discrepancies were solved by discussion. The coded material was made into themes, which were supported by quotations.

Quantitative data from the participants' questionnaires were used for descriptive analysis, presented as numbers or means with 95% confidence intervals (95% CI). Registration data described participation and withdrawal rates were presented as percentages. To describe the women's physical results after completion of the 12 weeks of exercise, the results of the physical test at baseline were compared with the re-test data, using mean differences and *t*-tests for parametric data, and the Wilcoxon signed-rank test for non-parametric data.

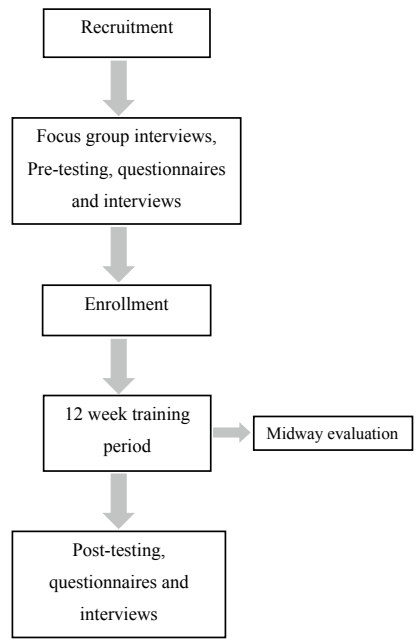

Fig. 1. Study flowchart.

RESULTS

A total of 27 women attended baseline testing and 2 women joined after baseline testing, so a total of 29 women commenced the training programme in January 2018. Ten of these women attended follow-up. Among those 10, the attendance rate was 70%. Based on the women´s statements from the evaluation, they gained knowledge about their bodies, a healthier lifestyle, and awareness of the importance of active living.

Characteristics

The majority of the women were of Somali descent, but also women from Bosnia, Iran, Pakistan and Afghanistan participated. The mean age was 51 years and mean BMI was 34. The women had a mean of >4 children. Table II shows the baseline characteristics of the participants.

Table II. Demographics for the immigrant women in the programme

Characteristics	All baseline-tested women (*n*=27)
Age[a], years, mean (95% CI)	51.1 (46.6–55.7)
Weight[a], kg, mean (95% CI)	92.9 (84.6–101.2)
Fat percentage[a], mean	43.9 (40.5–47.4)
Body mass index[a], kg/m^2	34.0 (31.8–36.3)
Number of children[a], *n*	4.6 (3.7–5.5)
Years resided in Denmark[a]	20.8 (19.2–22.5)
Regular consumption of medicines[b], %	18/15 (72)

[a]Mean (95% CI), [b]proportion that has regular consumption of medicines (%)

Flow of participation

Three women never attended an exercise class; 8 withdrew within the first month of training, and another 2 withdrew after 6 weeks of training. Of the remaining 16 women, 2 participated in fewer than 11 of the 24 exercise sessions. Thus, 14 women who were enrolled in the exercise programme completed the programme having attended 11 or more sessions. During the programme, more women (not recruited from the beginning) from the 2 housing areas showed interest in participating. It was decided not to reject women who were interested in participating and who met the inclusion criteria. Therefore, the final number of participants in the group was larger than those who initially registered. These "newcomers" do not figure in data other than the flow of participation. Fig. 2 shows a flowchart of participation.

Qualitative outcome

The pre-development and expectation statements from the women from the focus-group interviews were grouped into the following categories: "logistics/execution of the sessions", "content" and "'expectations".

Logistics/execution

One woman stated, "She [the clinician] should plan the exercising so it suits us […]; I can't on my own. I want to help with how to do it." Other participants were more

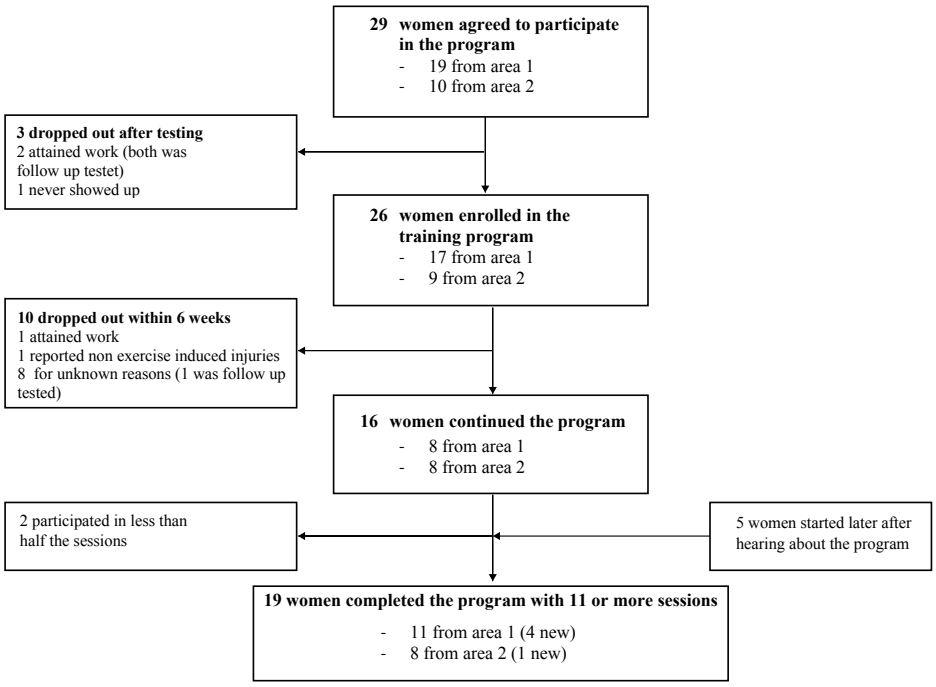

Fig. 2. Flowchart of the participation of the woman.

focused on the setting in which the sessions occurred, expressing concerns about closable blinds and closed doors. Here, we could observe that when closing doors and blinds, the women began to take off their head-coverings and felt much more willing to exercise. Furthermore, no interruptions, such as loud music, no surveillance, and their ability to understand the instructions were mentioned. It was important to the women that the location of the physical training was near where they lived, and for the training schedule to fit into their daily routines. This was taken into account and the exercise programme was provided in local settings close to the women's homes.

Content

Some of the women stated they wanted varying exercises, including cardio ("Different. Varying. I want to have pulse exercises") and without too much explanation about theory. It was observed that the women lost interest when the researchers leading the exercises talked too much about the theory behind the exercise programme. Therefore, the researchers were in constant dialogue with the women to define their needs, and the exercise programme was continuously modified.

Expectations

The women highlighted pain reduction ("I feel a lot of pain in my body, so this needs to get better"), as an issue, they would like to address. Pain was regarded as a problem by all the women and by several as influencing their physical functioning and activities of daily living. The women also wanted reassurance about pain mechanisms ("Show and tell, what we can do" […] "she [the clinician] can tell why you get pain in the knee").

Weight loss was an important goal ("everyone wants to lose weight. That is the best – very important"), and the acquisition of a flat belly was stated several times as an indicator for weight loss ("I like a flatter belly").

Attaining general wellbeing was another central expectation. The desire to become healthy, feel the pulse increase, strengthen the muscles, and get into shape was expressed by several participants ("I would like to get healthy" […]; "get into shape" […]; "I hope, I will get a lot better"), indicating motivation and high expectations of the benefits to be gained from the programme. The participants expressed such great interest in healthier living and guidance regarding healthy food that a session on nutrition was introduced into the programme.

Participants' post-exercise experience

Analysis of the 12-week follow-up group interviews raised the following themes: "pain reduction", "general wellbeing", "motivation" and "awareness".

Pain reduction

Some of the women had experienced pain reduction during the programme ("I had pain, and now it is better. Now it only hurts sometimes" […]; "really good. I feel better. But I still have pain in my entire body"). Although still experiencing a degree of pain, these statements indicate that some pain reduction was achieved through participation in the programme. Other participants reported experiencing no pain reduction, but felt increased functioning ("it helps a lot to exercise").

General wellbeing

After the end of the 12 weeks, there was an overall agreement expressed among the women that exercising improves wellbeing and everyday life. The women experienced higher energy levels, and some experienced better quality of sleep, indicating benefits from the programme ("I feel better" […]; "I sleep better after exercising").

Motivation

The women stated that the social aspect of the exercise training made them want to attend ("It is good to talk to others" […]; "we exercise, and we have fun together"), and kept them motivated to continue with physical exercising ("Yes, you have to continue exercising!").

Awareness

In addition to the motivation for continued physical exercise, some women stated that they had learned a lot during the programme, and had used their new knowledge to engage in exercise in a fitness centre on their own, and several even stated that they were doing some of the exercises at home ("I have learned so much that I can help myself and practice at home").

Quantitative outcome

Full test data were obtained for 10 participants. Among these, the attendance rate was 70%. Overall, there were no significant changes in any of the outcome measures. Six of 10 women had a slight reduction in weight and BMI, 6 women improved on the 6MWT, and 5 women improved on the STS. Scores on the EQ-5D did not show improvements in any domain.

DISCUSSION

The primary scope of this study was to assess whether this novel intervention was feasible. Therefore, the study focused on design, setting and execution more than the sample size and the effect of the intervention

(21). The current study was successful in recruiting and maintaining participants for the programme. It was not possible to measure significant physical improvement objectively. However, most women subjectively indicated improvement in parameters they had defined themselves.

Studies show that most women from ethnic minority groups in Denmark experience mental and physical health problems, and that they are vulnerable to developing chronic diseases, such as DM2 and COPD (3). These health problems were also seen in the participating women in this study, most of whom were overweight, had comorbidities, and had chronic diseases, such as DM2.

Engaging women from ethnic minority groups in physical activity and preventive health approaches has proven difficult (1). Thus, to engage the group of participants in our study, the women were involved in the development process of the exercise programme. This approach has been applied in other health areas (22, 23). In a study on pulmonary rehabilitation, focus-groups and peers were used to inform the rehabilitation programme (22). By involving the participants, individual mental or physical differences can be considered, and interventions can be differentiated for the benefit of each participant (22). The strategy of involving the women in developing the exercise programme in this study made the training relevant and feasible for most of the women. As the sessions progressed, more women from the 2 participating areas showed interest in participating in the exercise programme. Thus, the women not only found the exercise programme feasible for themselves but also advocated for the programme in their local community.

Study limitations

The language barrier was one of the principal limitations of the programme. The women had a basic knowledge of the Danish language, and communication misunderstandings could have led to doubtful findings. Professional translating or not including questionnaires should be considered for future research on exercise programmes with immigrant women. In Group 1 the attendees varied from session to session, which made it difficult to keep records, and there were some withdrawals during the training period. Different results and increased validity and generalizability could be achieved with a higher number of participants who attend more regularly and consistently. Inclusion of more women, housing areas and conduction of more focus group interviews could have supported higher data saturation and thereby greater generalizability and validity. On the other hand, this study is a feasibility study and, therefore, limited resources were available for including participants and conducting focus groups.

The majority of the conclusions of this programme are based on qualitative data collected at 2 time-points (before and after programme implementation), which can be biased because such reported results can depend on mood, time of day, and other circumstances that affect participants' feelings and perceptions. A longitudinal study of 6 months or longer, with a longer follow-up period and a larger sample size, would provide more illuminating and valid results. Possible confounders and mediators in this programme can also be discussed. Circumstances, such as the women's home and family life, their background of migration to Denmark, and other factors related to their mental and physical health, could have affected the success of the exercise programme.

Study strengths

A principal strength of this study was that we succeeded in motivating and maintaining the women throughout the 12-week training period. The programme was flexible and based on parameters that have been stated as important by the women. This led to high satisfaction and participation levels. Overall, the women attended regularly and were motivated.

Word of mouth spread to other women, and led to women who had not initially agreed to participate asking to join the programme. The information also reached social workers and doctors, and we were contacted by them about the relevance of the exercise programme. Three months after completion of the programme, 1 of the 2 groups continued to hold the exercise training sessions on their own. Considering the women's input into the training programme, enabled us to create an intimate space in which they felt safe and free, were able to ask difficult questions, and were able to discuss sensitive topics, such as pregnancy or incontinence. This open and honest communication allowed us to continuously modify the programme and to act when the women presented us with serious health issues. For example, it was decided to add a lecture about healthy diet to the programme because the women stressed the importance of healthy food, and we referred several women to their doctor with a note about different symptoms.

Internal validity was supported by logbooks, detailed descriptions of the training sessions, and blinded testing of the women's physical health at baseline and after the training sessions. Those factors also supported the external validity of the study, and we believe it will be possible for others to apply this approach in a similar setting. An exercise programme such as the

one described in this paper may lead to socioeconomic benefits. That is, if the women achieve increased health and wellbeing, it may empower them to be engaged more in society and in the labour market and lead to reduced costs in healthcare.

LEARNING PERSPECTIVES

What works?

During the study, it became clear that the programme was multidimensional, which requires open mindedness and flexibility towards the women's needs and wishes throughout the training period. It was important to be open-minded about changes in the planned content of trainings sessions, the women's mood, circumstances in the lives of the women, and cultural differences (e.g. Ramadan). It was important to include education about food and nutrition, and to provide help in relation to seeing doctors and with healthcare matters in general. Therefore, it is essential to have a direct contact person who knows the women, when offering a training programme. The women in the current study population are often left without support in health services, and there are no exercise programmes in Denmark that directly aim to reach immigrant women. The service needs to be located in the local area of the women, it needs to ensure privacy (e.g. allow for drawn curtains and locked doors), as well as provide the flexibility and time to discuss sensitive topics and health problems as a group or on an individual basis. The training sessions would work best with 2 or 3 instructors to ensure time and opportunity to address each woman. Every single exercise should be understandable without verbal instruction, and there should be many repetitions of the exercises, so that the women have the opportunity to learn the exercise and improve in performing it. The social aspect of the exercise programme is also important. Factors such as social acceptance, having fun and time to talk were important motivating factors. Gifts, reminders, and prizes from the trainers in the programme can increase the motivation of the participating women. It is planned to use the experiences reported in this paper to implement other training projects for immigrant women in the municipality in the future.

Conclusion

The results of this study indicate that it is feasible to recruit participants and conduct an exercise programme to motivate and maintain immigrant women in engaging in physical exercise. The women reported that they had gained knowledge about their bodies, a healthier lifestyle, and had learned about the importance of active living. Furthermore, this study highlighted the importance of involving the women in the development of such a programme, as well as the importance of factors such as privacy, a local setting, and trust of the therapists, when offering a training programme to immigrant women. It was not possible in this study to investigate quantitative effects of exercising; therefore, further research is needed to measure a valid outcome in this population.

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The authors have no conflicts of interest to declare.

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