Chapter 7

Implementation of a physical activity intervention for people with rheumatoid arthritis: a case study


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Abstract

Objectives To investigate the potential facilitators and barriers regarding the implementation on a larger scale of an internet-based physical activity intervention which had previously proved to be effective in a randomized controlled trial concerning sedentary patients with rheumatoid arthritis (RA).

Methods Assuming a central delivery of the intervention by 2 trained physical therapists in 4 regions in the Netherlands, the following activities were employed: the recruitment of potential participants (RA patients), the acquisition of cooperation from referring rheumatologists and the acquisition of reimbursement from regional health insurance companies. Evaluation was done by means of the Reach, Evaluation, Adoption, Implementation and Maintenance framework, of which the following 3 dimensions were considered relevant: Reach (the number of potential participants), Adoption (readiness for adopting the program in real life among rheumatologists) and Implementation (the extent to which the intervention could be delivered as intended). Evaluation measures comprised a postal survey among 927 patients with RA in 2 regions, a telephone survey among rheumatology centers in 4 regions and consultations with 5 regional health insurance companies.

Results Seventy-six out of 461 responding RA patients (20%) met the original study inclusion criteria (being sedentary and having access to the internet) and were interested in participation. However, the potential costs of the purchase of a bicycle ergometer and the interference with patients’ current physical therapy were obstacles for eligible patients actually to participate. Rheumatologists in 4 out of 5 rheumatology centers were willing to participate. All 5 health insurance companies were willing to reimburse the guidance and feedback by the physical therapist, and the costs of the internet site (estimated costs €271 (£203) per patient per year), but not the bicycle ergometer (estimated costs €350 (£262)), provided that current physical therapy would be discontinued.

Conclusions Facilitators for the implementation of an internet-based physical activity intervention were: (1) a considerable proportion of RA patients were eligible and interested in the program; (2) the majority of rheumatologists were willing to refer patients; and (3) health insurance companies were willing partially to reimburse the intervention. Barriers were the additional costs for patients and their unwillingness to discontinue current physical therapy. These findings underscore the need for additional research into barriers to participation in physical activity interventions among patients with RA, and in reimbursement strategies in particular.
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Introduction

Over the past few decades, many studies have demonstrated the effectiveness and safety of exercise and physical activity interventions for patients with chronic arthritis\(^1,2\). The currently available evidence is mainly based on clinical trials, executed under controlled research conditions. It is, however, conceivable that real-world conditions interact with or moderate the impact, accessibility, reach or sustainability of physical activity interventions\(^3,4\). Indeed, a number of studies have demonstrated the difficulties of translating evidence-based intervention protocols into clinical practice in general\(^5,6\).

Within the field of arthritis research, the knowledge regarding the implementation of evidence-based physical activity interventions in real life is limited. So far, 3 papers have been published in which process and/or outcome data regarding the actual implementation of an exercise or physical activity intervention for people with arthritis on a scale larger than that of a (controlled) trial setting are presented\(^7-9\). Domaille et al.\(^9\) investigated whether a physiotherapy program for the management of knee osteoarthritis (OA) could be successfully implemented into clinical practice. The authors compared the outcomes of the implemented program with those reported in 4 clinical trials, which used similar interventions and evaluation tools. The implemented program appeared to be effective in reducing pain, stiffness and disability. It was concluded from this study that the knee OA program could be successfully implemented. De Jong et al.\(^10\) assessed the feasibility and effectiveness of 2 exercise and health education programs for people with OA of the hip and knee within real-life conditions. The programs were implemented in 4 regions in the western and central parts of the Netherlands. Both programs appeared to be effective in reducing pain, whereas the knee program was also found to improve OA knowledge and self-efficacy. In neither of these programs an improvement in mobility was seen. As the outcomes observed in the implementation study were similar to those obtained in the original randomized controlled trials (RCTs) they were based on, it could be concluded that both programs appeared to have ecological validity, meaning that the methods, materials and setting used in the trials appeared to reflect the real-life situation\(^11\). Boutaugh\(^7\) reviewed the effectiveness of the implementation of 2 physical activity programs for people with arthritis: an on-land exercise program called People with Arthritis Can Exercise (PACE)\(^12\) and an aquatic exercise program called the Arthritis Foundation Aquatic Program (AFAP)\(^13\). In total, nine studies, investigating the effectiveness of the PACE and AFAP programs within real-life community settings, were reviewed. The results of the review showed that both programs were effective with respect to improving self-efficacy, physical and psychosocial functioning. It was, however, not reported whether the outcome data regarding the effectiveness of the implemented programs were comparable with effectiveness data collected under more controlled conditions. With respect to the process evaluation, two main problems were reported: lack of quality control and low participant utilization. In addition to these three papers, van der Giesen et al.\(^14\) reported the preliminary results of a study on the implementation of intensive group exercise therapy for patients with rheumatoid arthritis (RA). Recruitment and training of providers, the cooperation of rheumatologists and nurse specialists, and reimbursement by health insurance companies in 4 regions in the Netherlands were successfully accomplished, but patient recruitment did not meet expectations.

In addition to the literature evaluating actual implementation of physical activity interventions in arthritis, a number of studies have been investigating potential barriers and facilitators, without actually performing the implementation. Several studies have demonstrated that disease-specific characteristics, such as pain, stiffness, fatigue and
mobility problems, highly influence the physical activity behavior of patients with arthritis\textsuperscript{15-19}. In addition, sociodemographic and psychosocial factors such as age, gender, education, social support, perceived benefits and self-efficacy were found to influence arthritis patients’ decision to engage in physical activity or exercise\textsuperscript{20-24}. Moreover, Iversen et al.\textsuperscript{25} have demonstrated that rheumatologists’ beliefs about the effectiveness of various forms of exercise play an important role in the promotion of physical activity and exercise behavior among patients with RA.

In almost all studies in which (potential barriers for) the implementation of physical activity interventions was evaluated, a theoretical framework guiding these evaluations was lacking. A possible reason for low usage of theoretical frameworks might be their limited availability, especially of those frameworks that are explicitly designed to evaluate the implementation of health promotion interventions. The one framework that is available\textsuperscript{26} comprises five dimensions: Reach, Efficacy, Adoption, Implementation and Maintenance (RE-AIM). The RE-AIM model can be used to consider systematically the strengths and weaknesses of an intervention in order to evaluate its potential for implementation\textsuperscript{27}. Reach is defined as the percentage of potentially eligible participants who will take part in an intervention, and how representative they are of the population from which they are drawn. Efficacy or effectiveness concerns both the intended results of an intervention and also the possible negative or unintended consequences on quality of life and related factors. Adoption refers to the participation rate and representativeness of both the setting (e.g. worksites or medical offices) in which an intervention is conducted and the intervention agents (e.g. physicians or health educators) who deliver a program. Implementation refers to the extent to which various components of an intervention are delivered as intended. Finally, the Maintenance dimension includes both individual and setting levels. At the individual level, it refers to the long-term results of intervention, defined as a minimum of 6 months following the last contact. At the setting level, ‘Maintenance’ refers to the extent to which organizations will continue an intervention or program once a study or initial trial is completed. Both Estabrooks\textsuperscript{28} and Dzewaltowski\textsuperscript{3} have successfully demonstrated how to apply the implementation of the RE-AIM model when evaluating physical activity interventions. Table 1 describes the questions that should be addressed in order to evaluate physical activity interventions according the above-mentioned 5 dimensions.

Based on the principles of the RE-AIM model, the current article aims to describe the results of a case study investigating the potential barriers and facilitators regarding the implementation of an internet-based physical activity intervention for patients with RA, which proved to be effective in an RCT\textsuperscript{29}.

\textbf{Methods}

\textbf{Intervention description and implementation aims}

The effectiveness of an individually supervized, internet-based physical activity intervention was established in an RCT among 160 patients with RA\textsuperscript{29}. In this trial, in which two 52-week, internet-based physical activity programs were compared, the following inclusion criteria were applied: RA according to the 1987 American College of Rheumatology criteria for RA\textsuperscript{30}, not being physically active for 30 minutes in succession on a moderate intensity level on at least 5 days per week, being in possession of a computer with internet facilities, being able to cycle on a bicycle ergometer, and being interested in a study on a physical activity program. Half of the patients were randomly assigned to a home-based physical activity program, delivered through the internet, with individual supervision by a
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In this program, individual physical activity schedules were offered weekly by means of a password-secured website. Patients received a bicycle ergometer on loan and had access to an online discussion forum and three-monthly group sessions. The other patients were randomized to a password-secured website containing general information on physical activity and arthritis (general training group: GT). It was concluded that the IT intervention was more effective with respect to increasing the amount of physical activity than the GT intervention29.

Table 1. Conceptual definitions and corresponding evaluative questions across the RE-AIM dimensions28

<table>
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<tr>
<th>Dimension</th>
<th>Conceptual definition</th>
<th>Recommended evaluative questions</th>
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| Reach (Individual level) | The proportion and representativeness of the individuals who participate in the intervention. | Who is eligible and reasons for criteria?  
Who is excluded and reasons for exclusion?  
What is the total number of potential participants?  
How many decline participation?  
How many were not contacted?  
How many agree to participate?  
How many actually participate?  
What is the participation rate (participants/potential participants)?  
Are the participants similar to eligible non-participants on basic demographics and primary outcomes? |
| Efficacy (Individual level) | The degree to which the level of physical activity of the study participants is changed. | Did physical activity change?  
Were there adverse effects? |
| Adoption (Setting level) | The proportion and representativeness of the settings, organizations or agents that use the intervention. | What organizations are eligible and reasons for criteria?  
What is the total number of potential organizations?  
How many decline participation?  
How many were not contacted?  
How many agree to participate?  
How many actually participate?  
What is the adoption rate (participating organizations/potential organizations)?  
Are the participating organizations similar to eligible non-participating organizations on basic resources? |
| Implementation (Setting level) | The level of fidelity to the protocol of the intervention. | To what extent were the various intervention components delivered as intended (in the protocol)?  
What was the timeliness of delivery?  
Was the protocol adapted?  
To what extent did the participants receive the intervention components?  
To what extent did the participants enact the intervention components? |
| Maintenance (Individual and setting level) | The level of sustained use of the intervention at the organizational level and the sustained participation in physical activity at the individual level. | Individual level:  
What were the long-term effects (minimum in 6–12 months following intervention)?  
What was the attrition rate?  
Organizational level:  
To what extent were different intervention components continued or institutionalized?  
Was the original program modified? |
After completion of the trial, an extension study was undertaken, in which potential barriers and facilitators regarding a larger scale implementation of the above-mentioned IT intervention were investigated. Information about these barriers and facilitators was needed in order to be able to decide whether an actual implementation of the intervention would or would not be feasible. The purpose of the extension study, which was set up as a case study, was to have 200 eligible patients with RA being able to participate in the 1-year IT intervention in 4 different regions in the Netherlands: eastern Gelderland, eastern Utrecht, Northern Brabant and central Zuid-Holland. The Medical Ethics Review Committee had approved the study protocol of the original RCT, and judged that no additional permission was required for the extension study.

Preparatory activities

Regarding the organizational structure, based on the nature of the intervention and the number of patients to be treated, it was considered that two physical therapists delivering the intervention would be sufficient. These providers would all operate from one location (Leiden University Medical Center), and visit the patients for initial assessments and group meetings in the 4 regions.

An advisory board was appointed, consisting of 2 rheumatologists, representatives from the national arthritis patient organization (‘Reumapatiëntenbond’), the Dutch Arthritis Association (‘Reumafonds’), the Netherlands Organization for Health Research and Development, and 2 other experts in the field of physical activity for patients with arthritis. The 4 regions were selected in consultation with the advisory board, including thinly, as well as densely, populated regions. Subsequently, the corresponding rheumatology centers and rheumatologists were identified.

A standardized provider intervention manual was developed, describing how the original intervention could be extrapolated and implemented in the 4 regions. Furthermore, in consultation with an econometrician, a cost analysis of the internet-based physical activity intervention was made. The annual costs were estimated at €271 (£182) per participating patient (initial assessment, comprising weekly physical activity schedules, sending and answering weekly e-mails, occasional telephone contacts, organizing a maximum of 4 group meetings per group in every region, updating the website, sending newsletters). To estimate the costs of the bicycle ergometer, 3 suppliers of bicycle ergometers were approached. The minimum price for a bicycle ergometer that would suit the quality demands for participation in the physical activity intervention and usage by patients with arthritis was €350 (£262), in the case of purchase, or €30 (£22) per month in the case of a lease arrangement.

Evaluation framework

The case study was conducted according to the principles of the RE-AIM model. Although the RE-AIM framework was originally developed to evaluate actual implementation processes, in the present study it was used systematically to identify potential barriers and facilitators regarding the future implementation of an internet-based physical activity intervention for patients with RA. As this study did not concern an actual implementation process, the dimensions ‘Efficacy’ and ‘Maintenance’ were not considered relevant for the analysis. Therefore, the results of the case study are described according to ‘Reach’, ‘Adoption’ and ‘Implementation’.

In order to determine which proportion of patients with RA would be potentially eligible
for participation in the physical activity intervention (Reach dimension), a short questionnaire was sent to 927 RA patients from 2 rheumatology outpatient clinics, situated in 2 of the 4 selected regions (Northern Brabant and central Zuid-Holland). Two rheumatologists working in these outpatient clinics provided the registries of RA patients who had been visiting their outpatient clinic in the previous 15 months. The registries contained the names and addresses of the patients and were sorted in ascending order by the date of their forthcoming visit to the outpatient clinic. The questionnaires were sent by postal mail, together with a letter explaining the aim of the study and a response envelope. It was decided to wait for the results from the 2 selected regions, before sending the questionnaires to the patients from the other 2 regions.

In total, the questionnaire contained 10 questions. The first 5 questions concerned the same 5 initial inclusion criteria as employed in the original study: availability of a computer with internet facilities, being able to use the internet and e-mail, not being too physically active, being able to cycle on a bicycle ergometer, and being interested in participation in an internet-based physical activity program. Two other questions evaluated patients’ current participation in physical activity or exercise interventions. To be able to define the potential reach of our intervention further, the final questions included in the questionnaire evaluated patients’ willingness to invest in a bicycle ergometer. First, it was evaluated whether or not patients were already in possession of a bicycle ergometer. Then, patients were asked how much money they would be willing to spend on a new bicycle ergometer if they did not possess one. The questions asked about their willingness to pay a one-off purchase cost, as well as for a lease agreement with monthly costs.

In order to evaluate the “Adoption” dimension, the relevant settings and subsettings were identified. This study took place within the Dutch health care setting. Within this setting, the following subsettings were considered relevant: (a) rheumatology centers, including referring rheumatologists; (b) health insurance companies and (c) the providers of the intervention (i.e. physical therapists). We selected 4 rheumatology centers in the 4 regions. Subsequently, 4 rheumatologists, each representing 1 rheumatology center and 1 region, were contacted by telephone. They were sent additional information about the intervention and implementation study by e-mail. One rheumatologist declined participation, so another rheumatologist from another rheumatology center in the same region (central Zuid-Holland) was approached. Because the internet-based physical activity intervention was to be implemented within the Dutch health care setting, the willingness of health insurance companies partially or fully to reimburse the intervention was examined, as there was no defined insurance reimbursement structure yet available for this intervention. Furthermore, because for this particular intervention we were able to build on the structure proven to be successful in the original RCT29, we considered that only two physical therapists would be needed, both of whom would operate from a single location. Therefore, the ‘provider subsetting’ was not considered to be a relevant factor in the study.

In order to collect information regarding the Implementation dimension, two meetings with the advisory board were organized. During this meeting, it was discussed whether or not specific adjustments to the original intervention should be made, and how to control and monitor the quality of the intervention.

Results

The findings of the 3 elements of the RE-AIM model used in this study are described below.
Reach

A total of 461 patients returned a completed questionnaire (response rate 50%). Data on the (sociodemographic) characteristics of the patients who did not send back the questionnaire are not available. Table 2 shows the proportions of patients fulfilling the above-mentioned inclusion criteria. Seventy-six (20%) patients fulfilled all 5 described criteria. Furthermore, the results of the questionnaire showed that 121 patients (27%) currently participated in some form of physical activity intervention or exercise therapy. Of these patients, 30 (25%) were willing to give up these interventions or therapy in order to switch to the internet-based physical activity intervention. When the other 5 initial inclusion criteria were also taken into account, the results showed that, of the 76 patients who fulfilled these criteria, 17 (22%) participated in some form of physical activity intervention or exercise therapy, and 3 of these patients (18%) were willing to give up these activities.

Table 2. Number (%) of patients with rheumatoid arthritis who fulfill the inclusion criteria for participation in the study on the implementation of an internet-based physical activity program (n=461)

<table>
<thead>
<tr>
<th>Inclusion criterion</th>
<th>Number (%)</th>
</tr>
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<tbody>
<tr>
<td>In possession of computer with internet facilities</td>
<td>276 (60)</td>
</tr>
<tr>
<td>Being able to use internet and e-mail</td>
<td>248 (55)</td>
</tr>
<tr>
<td>Not being physically active for 30 minutes in succession on a moderate intensity level on at least 5 days a week</td>
<td>225 (53)</td>
</tr>
<tr>
<td>Being interested in participation in an internet-based physical activity program</td>
<td>158 (36)</td>
</tr>
<tr>
<td>Being able to cycle on a bicycle ergometer</td>
<td>381 (84)</td>
</tr>
<tr>
<td>Fulfilling all of the above-mentioned criteria</td>
<td>76 (20)</td>
</tr>
</tbody>
</table>

A total of 132 patients (29%) possessed a bicycle ergometer. Additional information about the type and quality of this ergometer was not gathered. Table 3 shows the results of the patients’ willingness to invest in a new bicycle ergometer in order to participate in the intervention (if they did not already possess one). In total, 13 (5%) and 24 (8%) patients said that they would be willing to invest the required amounts of €350 in the case of purchase or €30 per month in the case of leasing, respectively.

Table 3. Number (%) of patients with rheumatoid arthritis who are willing to pay various amounts of money for a new bicycle ergometer required to participate in an internet-based physical activity intervention

<table>
<thead>
<tr>
<th>One-off amount</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No money</td>
<td>182 (62)</td>
</tr>
<tr>
<td>€0 to €150</td>
<td>64 (22)</td>
</tr>
<tr>
<td>€150 to €300</td>
<td>37 (12)</td>
</tr>
<tr>
<td>€300 to €450</td>
<td>11 (4)</td>
</tr>
<tr>
<td>€450 to €600</td>
<td>2 (1)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Monthly amount</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No money</td>
<td>179 (62)</td>
</tr>
<tr>
<td>€0 to €15</td>
<td>87 (30)</td>
</tr>
<tr>
<td>€15 to €30</td>
<td>23 (8)</td>
</tr>
<tr>
<td>€30 to €45</td>
<td>1 (0)</td>
</tr>
<tr>
<td>€45 to €60</td>
<td>0</td>
</tr>
</tbody>
</table>
Adoption

In total, 13 rheumatologists, attached to 4 rheumatology centers, participated in the study. The primary investigator (MvdB) visited all 4 representative rheumatologists to discuss further the practical details of the implementation process, and in 1 outpatient clinic a presentation was given to all staff members of the rheumatology department. All 4 representative rheumatologists appeared to be enthusiastic about the implementation plans and agreed to cooperate.

Five representatives from 5 large health insurance companies, operating in the 4 targeted regions in the Netherlands, were approached. All agreed to reimburse the direct costs of the physical activity intervention, but not the costs of the bicycle ergometer. Furthermore, they would not reimburse any other forms of individual or group exercise therapy carried out simultaneously with the internet-based physical activity intervention.

Implementation

Because the health insurance companies only agreed to partial reimbursement, patients’ willingness to pay was limited, so potential adjustments to the original intervention were discussed during 2 meetings with the advisory board. The participants of this meeting all agreed that, if the implementation of the internet-based intervention were to be obstructed because of lack of financial resources, the bicycle ergometer could perhaps be replaced by other, less expensive, exercise equipment and/or other physical activities. For example, the main activity of cycling on a bicycle ergometer in the original intervention could be replaced by the activity of outdoor walking\(^31\). If the intervention did need to be switched to a primarily walking-based program, the advisory board recommended the provision of a pedometer\(^32,33\).

Because not many patients appeared to be willing to give up their current therapies in order to switch to the new physical activity intervention, the advisory board discussed the possibility of offering the physical activity intervention outside of the Dutch health care system. However, in this case, individual supervision by the physical therapists could no longer be provided.

In general, it was discussed that the disadvantage of incorporating large modifications to the content of the intervention, such as switching to a walking-based program or leaving out the individual supervision, was not being able to build on the proven scientific efficacy of the original program.

There was also discussion on how to control and monitor the quality of the intervention. It was decided that only certified providers would be allowed to offer the intervention. In order to facilitate the certification process of these providers, the development and formal registration of a quality mark would be needed. In addition, regulations regarding the initial training and continuous education of the providers would have to be formulated. During the course of the study, a number of organizations showed interest in taking a leading role in the future arrangements and quality assurance of the intervention; however, no decision was made as to who would take on this role. Drawbacks that were raised during the discussions included potential competition among different organizations currently involved in the education and training of physical therapists, and possible competition among ‘general’ and ‘specialized’ primary physical therapists. It was decided to explore this issue further with the physical therapists’ professional organization and the Dutch Arthritis Association.
Discussion

There is a large body of evidence regarding the effectiveness and safety of exercise or physical activity interventions for people with arthritis. However, little is known about the extent to which these evidence-based interventions are feasible, accessible and sustainable, and remain effective when they are translated into daily clinical practice. The results of our case study showed that possible barriers and facilitators regarding the implementation of our evidence-based, internet-based physical activity intervention could systematically be analyzed by using the RE-AIM model. The cooperation of rheumatologists, and the rheumatology centers to which they were attached, appeared to be feasible. However, the survey among RA patients showed that the final number of patients who would actually participate would be low.

One main barrier for implementation on a larger scale appeared to be the funding of the physical activity intervention. In the Netherlands, as of January 2006, there has been a single statutory basic health care insurance policy for everyone. Statutory basic health care insurance covers the cost of basic medical care. In addition, health care insurers offer supplementary packages to cover the cost of additional health care, which may or may not include reimbursement of individual or group exercise therapy. Although, in our study, the insurance companies were willing to reimburse the direct costs of the intervention (i.e. the costs regarding the supervising physical therapists), neither these insurance companies nor the patients were willing to invest in the required exercise equipment (i.e. the bicycle ergometer). Problems regarding the reimbursement of health promotion interventions when implemented on a larger scale have been reported before. In Australia a major obstacle for the implementation of the ‘SNAP’ approach (a program for the management of 4 behavioral risk factors: smoking, nutrition, alcohol and physical activity) into general practice was the lack of a funding model\(^3^4\). Another barrier observed in the present study was the participants’ limited willingness to give up their current individual or group exercise therapies in order to switch to the new physical activity intervention. Health insurance companies would not reimburse two different therapies or interventions simultaneously. As stated above, individual or group exercise therapy is, to a large extent, reimbursed for people with arthritis in the Netherlands, but for the proposed intervention a financial contribution from the patients themselves would be needed. The discussion regarding the extent to which patients with arthritis, similarly to healthy people, should take responsibility for undertaking sufficient levels of physical activity is still in its initial stages in the Netherlands. This discussion should always take into account the fact that chronic diseases generally place a large burden on the individual’s financial situation. Apart from the additional costs associated with their switch to another intervention, satisfaction and habituation with current physical or exercise therapy may also have played a role in patients’ reluctance to participate in the present study.

In order to make future implementation of the internet-based physical activity intervention possible, several possible adjustments to contents of the program have been discussed, such as leaving out the rather expensive bicycle ergometer or offering the intervention without individual supervision by a physical therapist. However, these adjustments would introduce the disadvantage of not being able to build on the proven efficacy of the original program. Although it has been established that this so-called process of re-invention can take place without hampering successful implementation of interventions\(^3^5\), it can also fail the dissemination process if the key components of an intervention are changed\(^3^6\). Future research should further investigate whether the advantages of making the program adjustments outweigh the disadvantages of these re-inventions.
When interventions are implemented on a larger scale, it is important to be able to control and protect the quality of these interventions. Indeed, within the Implementation dimension of the RE-AIM model, the extent to which the participants received the intervention components as intended is evaluated. In this study, in order to decrease the risk of violations to the intervention protocol, a written standardized intervention protocol for the providers was developed. Furthermore, discussions on the registration of a quality mark for the delivery of physical activity programs for patients with arthritis were started. A quality mark would ensure that only certified providers would be allowed to offer specific interventions to RA patients. Discussions on how this would influence competition among physical therapists in the Netherlands, as well as who would be responsible for controlling and managing this quality mark, are still ongoing.

A limitation of our case study was the fact that the actual implementation had not yet taken place. Therefore, the dimensions ‘Efficacy’ and ‘Maintenance’ of the RE-AIM model could not be taken into account. As a consequence, information about possible adverse effects, as well as the long-term results of the internet-based intervention and the extent to which organizations would continue to offer this intervention, could not be provided. In our study, the health insurance companies were willing to reimburse the direct costs of the intervention for a period of 12 months; however, future activities should aim to acquire structural financial commitment. Another limitation was the inclusion of a limited number of patients, from 2 selected regions. Although the regions were geographically distant, it is conceivable that the results from surveys in other regions in the Netherlands would have differed from the data presented. Moreover, with a response rate of 50%, it cannot be ruled out that, in the RA population as a whole, the proportion of patients meeting the inclusion criteria and being interested in the intervention may differ from the rate observed in the present case study.

In conclusion, this case study on the implementation of an internet-based physical activity intervention showed that the lack of full reimbursement and the obligation to stop concurrent physical therapy were major obstacles for RA patients to participate. Neither of these barriers has been extensively addressed in previous studies, but they may play a role in physical activity interventions with other modes of delivery. As the internet is a promising medium with which to enhance physical activity in patients with RA, future activities should focus on exploring other possible ways to achieve structural, partial or total funding for internet-based physical activity interventions, delivered within or outside the health care system. These efforts would involve inter-organizational partnerships, including patients’ representatives, public health agencies, clinical care providers, community organizations, health insurance companies and others. Furthermore, complementary qualitative studies should be carried out in patients with arthritis to investigate in more depth the barriers that play a role with respect to switching over to alternative physical activity or exercise interventions and the ensuing financial consequences.

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