A blended intervention

In a large-scale collaboration with researchers and physical therapists based in the Netherlands, Professor Cindy Veenhof and Corelien Kloek have played leading roles in devising an eHealth learning approach that aims to increase physical activity among patients with osteoarthritis.

Dr Veenhof, you were recently appointed Professor in Physical Therapy Sciences at the University Medical Center (UMC) Utrecht. Can you provide an introduction to the career path that led you to this position?

CV: After graduating in Human Movement Sciences and Physical Therapy, I worked as a physical therapist and researcher at the Netherlands Institute for Health Services Research (NIVEL). In 2000 I started my PhD at NIVEL, during which I studied the effectiveness of behavioural graded activity in patients with osteoarthritis of the hip or knee. This led me to take up a position as the research coordinator of the research programmes Allied Health Care and Sport, and Physical Activity and Health at the NIVEL Institute. It was only in October 2014 that I was appointed my current position as Professor in Physical Therapy Sciences at UMC Utrecht in the Department of Rehabilitation, Nursing Sciences and Sports.

The e-Exercise programme aims to help reduce physical therapy costs. How does the programme achieve this goal?

CV&CK: In the Netherlands, the mean number of treatment sessions (physical therapy) of patients with osteoarthritis is 17. By developing a blended intervention which integrates face-to-face sessions with an online program, we reduced this to four or five sessions. A large part of the exercise can be performed at home with support of the online tool.

The e-Exercise programme helps to tackle non-adherence to home exercises in physical therapy. How does this work?

CV&CK: In our blended e-Exercise intervention, we use technology to influence patients’ behaviour. This strategy is called ‘persuasive technology’ and we have incorporated several specific technical components in order to

Fuelling physical activity

Researchers from the Netherlands Institute for Health Services Research, the University of Tilburg and the University Medical Center Utrecht, have developed e-Exercise – a new health intervention for patients with osteoarthritis that combines face-to-face physical therapy sessions with a web-based exercise programme.

As the most common form of joint disease, osteoarthritis is one of the leading causes of chronic pain and disability worldwide. Although it can occur in younger people, it primarily affects adults over the age of 45 and, as a result of the ageing population and the growing obesity epidemic, its incidence is likely to increase. As a group of mechanical abnormalities that involves the gradual degradation of joints, osteoarthritis has a range of symptoms that include stiffness, muscle weakness, a reduced range of motion and deformed joints.

Due to the intense pain and stiffness experienced by individuals with osteoarthritis, it is common for many patients to reduce their level of daily physical activity. However, a significant body of evidence suggests that exercise is in fact beneficial for these patients, with inactivity linked to reduced muscle power and a subsequent deterioration of physical functioning. Multiple studies have emphasised the positive effects of face-to-face exercise therapy for reducing pain and increasing physical function. Despite this, such programmes also place a weighty financial burden on health systems, particularly as the number of patients with osteoarthritis increases.

Indeed, in view of the prohibitive costs of face-to-face physical therapy programmes, a number of recent studies have focused on exploring the effectiveness of web-based interventions. These are cheaper because of the absence of face-to-face interaction with a qualified therapist. Additionally, these fully web-based interventions have the advantage of constant accessibility to patients. However,
stimulate adherence to home exercises. Firstly, each week automatic reminder emails are sent to inform the patient about new assignments and instruction videos on the e-Exercise website. Secondly, exercises and information are supported with videos, which help to make the programme more attractive. Thirdly, after each activity or exercise, the patient is asked to evaluate the assignment – and tailored feedback is automatically generated based on this evaluation. Finally, the patient’s number of website visits is visible to the physical therapist and low adherence can be discussed during the face-to-face sessions. Compared to usual physical therapy – mainly comprising of face-to-face sessions combined with home exercises – the patients using our blended e-Exercise intervention receive more reminders at home about their exercises.

What criteria did you use to decide to include five sessions with a physical therapist?

CV&CK: Based on the literature, we were able to establish that the average number of physical therapy sessions for patients with osteoarthritis is 17 in the Netherlands. Yet, in order to develop a cost-effective intervention, the number of sessions had to be much lower than one. This is probably needed in addition to the number of patients are rewarded with flowers that successfully recruit an above-average number of patients are rewarded with flowers. The e-Exercise programme is a collaboration between the researchers of NIVEL, Tilburg University and around 250 physiotherapists. What are the challenges of collaboration on this scale?

CV&CK: The challenge is to keep all the physical therapists motivated throughout the duration of the study, both in terms of including patients in the study and treating patients according to the protocol. Importantly, all physical therapists received thorough training prior to their participation in the study and, in order to generate motivation and inclusivity, a digital newsletter is sent out twice per month. e-Exercise researchers also send out frequent messages on Twitter. The physical therapists that successfully recruit an above-average number of patients are rewarded with flowers and a notification in the digital newsletter. Twitter messages are also frequently made by the researcher of e-Exercise.

How do you see the future of e-Exercise developing?

CV&CK: In the future, we anticipate that one online platform will be used for physical therapists. This platform will consist of different e-Exercise programmes, which are applicable to different types of chronic conditions such as diabetes mellitus, lower back pain, chronic obstructive pulmonary diseases or cancer. It will also incorporate a range of general exercises and instruction videos that will be suitable for patients with other acute injuries. Encouragingly, to date, physical therapists and patients have expressed enthusiasm about e-Exercise – however, its future depends on its financial feasibility. By reducing the number of sessions from 17 to four or five, physical therapists will need financial compensation, which may occur if more patients are keen to take advantage of this intervention.

PROGRAMME IMPLEMENTATION

From the inception of e-Exercise, Veenhof and her team have devoted significant time and attention to exploring its implementation. To this end, they created a project group – comprised of patient representatives, physical therapists, a health insurance company, a rehabilitation centre and an online physical therapy company – with a specific mandate to focus on the practicalities surrounding its implementation. Moving forwards, the hope is that the wider implementation of e-Exercise will have a positive effect on the lives of patients afflicted with osteoarthritis. There could also be broader applications of e-Exercise if adapted to other chronic diseases.

low adherence rates are a commonly reported pattern, with the lack of a professional presence thought to have a negative effect on patient motivation for exercise. As a result, there is therefore an urgent need for the development of cost-effective interventions that successfully encourage patients with osteoarthritis to engage in physical exercise.

AN INNOVATIVE INTERVENTION

It is in response to this need that a group of physical therapy researchers from the Netherlands Institute for Health Services Research (NIVEL), the University of Tilburg and the University Medical Center (UMC) Utrecht in the Netherlands have been working on the development of a cost-effective and implementable intervention for patients with osteoarthritis. Back in 2013, they created a fully automated and self-paced physical activity web-based programs for in-home use by patients with osteoarthritis. Entitled Join2move, it worked by slowly increasing the patient’s favourite recreational activity over the space of nine weeks. “We noticed that a lot of patients with osteoarthritis adhered to the mistaken belief that there was nothing they could do about the disease,” explains Professor Cindy Veenhof, currently based in the Rehabilitation, Nursing Sciences and Sports Department at UMC Utrecht and the former Research Coordinator at NIVEL. “A large group of these patients did not have the skills to self-manage their osteoarthritis, were not physically active and did not access support from caregivers – so we decided to develop an intervention that reached patients at home.” Encouragingly, Veenhof and her colleagues found that Join2move resulted in positive changes, leading them to conclude that it could be a useful means of promoting physical activity in sedentary osteoarthritis patients. However, Join2move only worked for a subgroup of patients. Others missed the face-to-face contact with the physical therapist. This inspired the researchers to develop a blended intervention.

Building on the success of Join2move, the researchers have since developed e-Exercise – a 12-week blended intervention for osteoarthritis, which combines a web-based exercise program with four or five face-to-face sessions with a physical therapist. Together, they are aiming to determine both the short- (three months) and long-term (12 months) effectiveness and usability of the intervention in comparison to conventional physical therapy care programmes. “Our hypothesis is that...
INTELLIGENCE

E - EXERCISE

OBJECTIVES

- To develop a blended intervention for patients with osteoarthritis of the hip and/or knee
- To study the cost-effectiveness of e-Exercise in patients with hip and/or knee osteoarthritis
- To discover the applicability of e-Exercise for other patient groups

KEY COLLABORATORS

Daniël Bossen PhD, Netherlands Institute for Health Services Research (NIVEL), Utrecht

Professor Dr Dinny de Bakker, NIVEL, Netherlands and Tranzo, Tilburg University

Professor Dr Joost Dekker, PhD, Department of Rehabilitation Medicine & Department of Psychiatry, EMGO Institute, VU University Medical Center Amsterdam, Netherlands

Dr J M van Dongen, Department of Health Sciences, EMGO Institute, VU University Medical Center Amsterdam, Netherlands

PARTNERS

Sint Maartenskliniek Nijmegen • Reade Amsterdam • Achmea • FysioForjou • KNBF • Dutch Rheumatoid Arthritis Foundation • Patients with Osteoarthritis

FUNDING

The Netherlands Organisation for Health Research and Development (ZonMw) • The Dutch Rheumatoid Arthritis Foundation • KNGF

CONTACT

Dr Cindy Veenhof
Chair in Physiotherapy Sciences, Department of Rehabilitation, Nursing Science & Sports
Brain Center Rudolf Magnus
University Medical Center Utrecht W01 121
PO Box 85500, 3508 GA, Utrecht, Netherlands

T +31 6 28 909 596
E c.veenhof-2@umcutrecht.nl

www.e-exercise.nl

There is an urgent need for the development of cost-effective interventions that successfully encourage patients with osteoarthritis to engage in physical exercise

e-Exercise is both at least equally effective and more cost-effective in terms of increasing physical functioning and physical activity compared to traditional therapy,” elaborates Corelien Kloek, a researcher who is working on the development of e-Exercise for her PhD project at the University of Tilburg.

OUTLINING THE METHODS

Importantly, the e-Exercise intervention combines around-the-clock accessibility to exercise with motivational patient support. For instance, in the first week of the programme the patients work with their physical therapist to select one physical activity – such as walking, cycling or swimming – for the web-based intervention. “Once the patients have logged in to the programme, they will be asked to determine their physical load ability based on a three-day self test, the results of which will be logged on the website,” elucidates Kloek.

“During the second face-to-face session in week two, the patient’s physical load ability will be discussed with the physical therapist, – and short- and long-term goals will be formulated based on the idea that goals encourage action.”

As a result of the assigned goals, the e-Exercise website automatically generates a number of targeted exercise assignments, with the duration of the selected activity gradually increasing until the patient reaches his/her personal short-term goal. Additionally, another section on the website focuses on increasing strength and stability, with specific exercises illustrated through interactive instruction videos that incrementally increase in number every four weeks. The website also includes a comprehensive ‘resources’ section, with information about the aetiology of osteoarthritis, physical activity, pain management, weight management and medication, among other topics. Automatic emails are sent to notify the participants about new assignments or fresh content uploaded to the site, helping to keep the users up-to-date.

Finally, in order to keep track of their progress, the patients are required to complete weekly evaluations that their physical therapist is also able to access. The information from these evaluations represents a useful resource for the third and fourth face-to-face sessions, which take place in week six and week 12, respectively. “In the final face-to-face session, physical therapists will support and encourage patients to maintain a physically active lifestyle,” states Veenhof.

“If necessary, they can plan an additional fifth session – something that is especially useful for patients who are less capable of performing unsupervised physical exercises.”

FUTURE STEPS

By blending human support and personal guidance with an accessible, self-directed online program for physical activity, the e-Exercise intervention successfully promotes patient motivation and adherence to exercise at home. Importantly, increased physical activity as a result of the programme has the potential to improve the health of osteoarthritis patients by providing pain relief and increasing physical functioning. Another key advantage of the intervention is that it generates a wealth of information about the patients’ experiences of home exercises, in turn enabling the physical therapists to tailor their face-to-face sessions to specific individual needs.

Looking ahead, Veenhof and her colleagues are confident that the blended eHealth approach they have adopted in e-Exercise has great potential for use in other healthcare fields, including speech therapy and occupational therapy. “Provided that it is used as an objective to achieve behavioural change and that patients visit a healthcare provider several times, this highly cost-effective approach could result in enormous health benefits at both individual and societal levels,” Veenhof concludes.