Original Article:

Introducing physical activity to type 2 Diabetes Mellitus patients and those at risk: learning points from the Netherlands.

*M. Hopman-Rock[1,2], M.W.A. Jongert[1,3], A.T.H. Van-Hespen[1], A.M.J. Chorus[1]

Abstract:

Type 2 Diabetes Mellitus (DM) is one of the major diseases for which strong evidence exists that physical activity prevents onset and may counteract progress. However, it is not so easy to change physical activity behaviour in people that are usually inactive. As type 2 DM has a high incidence and prevalence in the Netherlands, it has been chosen as a priority for a national effort called "De Beweegkuur" (based on the idea of Exercise on prescription). It is known that tailored exercise counseling is most helpful. However, it will be more (cost) effective if only a few profiles exist in which patients could be divided and treated. The first aim was developing such patient profiles. The second aim was to get an impression of how "De Beweegkuur" meets the possibilities of general practitioners (GPs) and physiotherapists and how the profiles could be handled by them. Therefore a qualitative study was performed. Information from an internet literature search and some patient focus group interviews was used as basis for a consensus meeting to formulate criteria for patient profiles. Eleven GPs and 38 physiotherapists were interviewed about existing practices, attitudes, and barriers to change. Three different patient profiles were developed. GPs saw type 2 DM patients and those at risk four times a year on average. According to these GPs, barriers for patients to change their physical activity were: cost (programmes are not yet in health insurance), anxious to exercise because of fatigue, and overweight. Physiotherapists who deliver programmes complain that GPs are not very willing to prescribe physical activity and to let their patients join special programmes from "De Beweegkuur". It is recommended to use the newly developed patient profiles to make it easier for the GPs and physiotherapists to divide patients in sub groups. This will enhance a more tailor-made guidance through the existing PA stimulating programme possibilities that are referred to "De Beweegkuur". Also, local cooperation between professionals should be improved.

Key words: Diabetes Mellitus, Physical activity, Exercise on prescription

Introduction:

For more than a decade now, it is well known that physical activity (PA) has established preventive benefits for type 2 Diabetes Mellitus (DM) and in patients with impaired glucose tolerance [1].

[1] TNO Quality of life, Department of Health Promotion, Leiden, The Netherlands

[2] VU University medical Center, Department of Public and Occupational Health, Amsterdam, The Netherlands

[3] The Hague University for applied sciences, Department of Innovation in physical activity stimulation and sports

***Corresponding Author:**
Prof. Dr. Marijke Hopman-Rock
TNO Quality of Life, unit Prevention and Healthcare
2301 CE Leiden, The Netherlands
Email: marijke.hopman@tno.nl

Recommendations exist for the minimum of required PA to benefit. Thirty minutes a day (on 5 but preferably 7 days a week; and in the newly developed recommendations 150 minutes a week) of moderate intensity PA is already beneficial in adults to prevent DM and to slow down progress [2]. It is determined that even modest improvement in controlling blood glucose (as sufficient levels of PA can do) acts to help prevent diabetic retinopathy, neuropathy, and kidney disease. Reducing blood pressure by PA has the potential to reduce cardiovascular complications (heart disease and stroke) by as much as 50 percent and it reduces the risk of retinopathy, neuropathy, and nephropathy by almost one-third [3].

However, a lot of patients and those who are at risk (due to overweight and glucose impairment) have difficulties entering and adhering to an adequate exercise and PA regime. This highlights the need to develop efficacious interventions for this group. Two theoretical models exist that

guide the development of useful interventions in the area of PA behaviour. These include the Transtheoretical Model [4] and the Social Cognitive Theory [5] that has been recently extended to a more integrative psychosocial theoretical model [6]. These theories include constructs such as motivational readiness (i.e., stage of change), self-efficacy, and decisional balance (i.e., perceived benefits/costs of behaviour). Also, specific counselling techniques have proven to be the best evidence choice in stimulating PA behaviour in general in the short term (6 months) [7]. Counselling has also been proven useful in type 2 DM patients [8].

In the Netherlands, the Netherlands Institute for Sports and Physical Activity (NISB; www.NISB.nl) coordinates several (>20) regional pilot projects in order to improve adoption and implementation of PA behaviour stimulation techniques (based on the just mentioned theories) in primary care. This initiative is called "De Beweegkuur" and is now specially focused on type 2 DM and patients at risk for this disease (glucose intolerance). "De Beweegkuur" is based on the "Exercise on Prescription" idea [9].

To be able to promote active life styles in primary care patients (including type 2 DM patients or those at risk for DM) using "De Beweegkuur" approach, there is a need for patient profiles for a more tailor-made guidance through the existing PA stimulating programmes in the Netherlands [10]. These programmes can be categorized into:

- Exercise treatment programmes in the health care setting (such as rehabilitation programmes or exercise programmes under supervision of a specialized physiotherapist);
- Preventive (adapted) physical activity programmes (programmes under supervision of a specialised sports instructor or a physiotherapist);
- Regular fitness or sporting activities.

The first aim of our project was to develop guidelines to link patient demands to existing exercise and PA programmes (developing so-called patient profiles). These profiles concern patients with diagnosed type 2 DM, in which PA is known to be preventive for complications. The second aim was to get an impression of how the national initiative of the NISB regarding "De Beweegkuur" for type 2 DM patients (at risk) meets the possibilities of GPs and physiotherapists and how the newly developed profiles could be handled. Both projects have been described in two separate Dutch organization for applied sciences (TNO) reports in Dutch [10,11].

Methodology

Developing patient profiles

Internet databases were searched to make an overview of existing exercise and PA programmes for type2 DM in the Netherlands.

To get insight into patients' demands we performed some focus group interviews with patients. Information from the internet search and the focus group interviews was used as basis for a consensus meeting with various experts to formulate criteria for patient profiles. Based on topics such as (co)morbidity, coping, exercise capacity, (perceived) barriers, anxiety, safety risks, and disease related symptoms, a long list of criteria was developed. In a consensus meeting this long list has been reduced to a short list of criteria.

In order to get an impression of how "De Beweegkuur" and other Exercise on prescription initiatives meet the possibilities of GPs and physiotherapists and how the patient profiles could be handled, a second study was performed. Eleven GPs and 38 physiotherapists were interviewed.

Telephone interviews of 20 minutes each with eleven GPs from a special GP network of the Leiden University were performed to unveil how GPs refer type 2 DM patients in normal daily practice. This is in order to formulate an advice about further implementation of "De Beweegkuur" and other Exercise on prescription initiatives. The interview was semi-structured and consisted of the following topics:

- Case finding;
- Cooperation with other professionals (medical specialists and physiotherapists);
- Medical profiles of patients that are possible participants in exercise on prescription programmes (severity of DM or glucose intolerance, co morbidity, etc);
- Knowledge about patient motivations, wishes, etc;
- Practical barriers to referral (health insurance costs, etc)

Textbox

"De Beweegkuur" (special Dutch programme in the area of Exercise on Prescription, implemented by the NISB).

During "De Beweegkuur" the GP looks for patients with type 2 DM or at risk (impaired glucose tolerance) in his or her practice. The GP prescribes the preventive "Beweegkuur" to the patient and refers to a lifestyle counsellor (could be the nurse practitioner or a special health education officer). The lifestyle counsellor designs a plan together with the patient, which could encompass one of the following options:

1. A PA and exercise counselling programme, 8 sessions with a life style advisor;

2. A combination of 6 counselling sessions with a lifestyle advisor and 5 exercise sessions with a physiotherapist;

3. A guided exercise programme, consisting of a combination of counselling by a life style advisor and exercising intensively coached by a physiotherapist during 12 weeks (once a week). This programme is based on a special exercise and PA stimulation programme for patients with type 2 DM under the responsibility of the Royal Dutch Society for Physical Therapy (KNGF) and developed by TNO (Dutch organization for applied sciences).

Indications for these three options are according the presence of:

- co morbidity;

- mobility problems;

- perceived barriers to starting (low stage of change level);

- low levels of exercise endurance (<90-100% of expected, after exercise tolerance testing with ECG).

Also, thirty-eight physiotherapists were approached for a structured interview of 30 minutes. These were all therapists who successfully completed a course on exercise and PA stimulation of type 2 DM patients from the KNGF and who's names and addresses could be found on the public website of the KNGF (names were randomly selected). Topics in general were reach, efficacy, adoption, implementation, and maintenance (according the RE-AIM model of Glasgow, [12]. More specifically this was operationalized as:

- Type of practice
- Recruitment of patients
- Number of programmes and number of participants (DM patients and those at risk)
- Demographics of patients (gender, age, etc);
- Registration of compliance and reasons of lapses;
- Prevalence of injury complications, calamities (safety) while participating;
- The transfer to other exercise and PA programmes or sports activities, PA advices;
- Adoption, implementation and maintenance in own organization;
- Reimbursement by health care insurance companies.

Results

Patient profiles study

From the focus group interviews it was learned that patients would like the programmes to be offered at close range to their homes. Most patients think PA is important for them. The most important reason for patients to participate in exercise programmes was increasing their exercise capacity. Most preferred activities were walking, cycling and cardio fitness. Current exercise referral was not perceived as effective by them.

Based on the short list of criteria the following four patient profiles (one for those meeting the PA recommendations and three for those not meeting the recommendations on PA) have been identified by the expert panel:

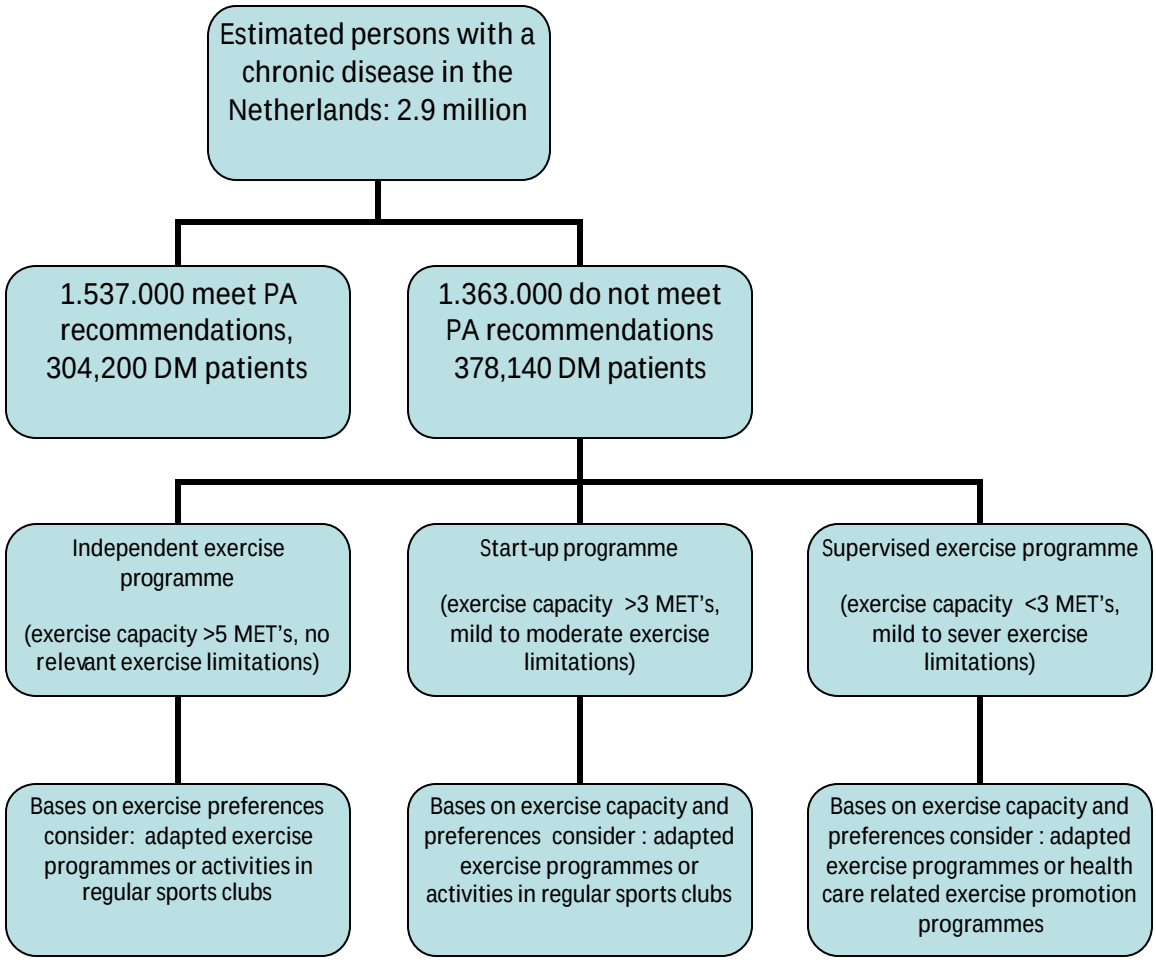

Figure 1: Patient profiles developed for Physical activity (PA) and sports stimulation of patients with type 2 DM [10]. Note: MET = metabolic equivalent of task [13]

As could be seen from the three profiles (independent programme, start-up programme, or supervised programme) the exercise preference and exercise capacity were the most important criteria. Patients who are able to exercise in a high regime > 5 METs, [13] could based on their preferences could be referred to independent exercise programmes such as programmes in fitness or sports facilities in the neighbourhood, based on their preferences. Those with some limitations and inexperienced exercisers (but with an exercise capacity > 3 METs) could be referred to start-up programmes of some weeks, that are developed to counsel patients and transfer them to existing programmes and sports facilities. The group with the most severe limitations in exercise capacities (< 3 METs) would be referred to special physiotherapist supervised programmes with and without extra counselling and health education.

Interviews with GPs

Type 2 DM patients had on average 4 consults a year with their GP, so case finding was not perceived as a problem. GPs stated that exercise and PA is important for their patients. However, they had little realistic insight into the wishes of their patients and referral to exercise programmes was by the GP not perceived as a priority area. Most GPs thought that fatigue and overweight were barriers to their patients, although this was not the case (known from the patient profiles interviews with patients). Most GPs worked together - in a referral system- with other professionals including physiotherapists. Actually much of the referral is delegated to the nurse practitioners. A barrier to referral however, was the fact that till to date physiotherapist care is not reimbursed in the Dutch basic health insurance package, nor were other exercise on prescription initiatives (such as referral to a fitness club).

Interviews with physiotherapists

The most important result was that recruitment of patients was difficult because GPs often do not refer enough patients (no perceived priority area; see results of interviews with GPs). If patients were referred (mostly by the nurse practitioners), it was difficult to get reimbursement of health insurance companies because preventive programmes are not provided. Patients, who actually attended, liked the programmes very much and were compliant. Motivation was enhanced by perceived safety of the accommodations, peer contacts and perceived positive health effects. Patients were also satisfied with transfer to other existing exercise and sport programmes (if supplied). No problems with safety or calamities were mentioned, and every practice could offer a fine fitness room. Adoption, implementation and maintenance was already accomplished or to be expected soon. The practices had at the time of the interview 0 to 7 programmes running, with on average 6 participants. The percentages of male and female participants were equal (on average) and most patients were in the age category of 50 years and older. Compliance was measured by the physiotherapists and was very high. However, no figures are known about compliance after the programmes were finished.

Discussion

The newly developed patient profiles could be used to make it easier for the GPs and physiotherapists to divide patients with type 2 DM (or those at risk) in sub groups. They could subsequently refer them more properly and (cost) effectively to exercise and physical activity programmes. To reach this, local cooperation between professionals (GP and physiotherapists) should be improved. As it now stands, "De Beweegkuur" will succeed in entering the Dutch basic health insurance package in 2010. This will be especially essential for people with low economic status, as they can not afford expensive PA programmes without imbursement from the insurance. Hopefully, this policy measure will improve referrals from type 2 DM and patients with glucose impairment into the right preventive programmes. A similar intervention program is also run in South Australia ("Do It For Life": see http://www.health.sa.gov.au/Default.aspx?tabi=527). In the Australian programme, participants with low social economic status could partly be covered by the Medicare system.

Unfortunately, exercise and physical activity programmes for persons with chronic diseases and disabilities in the Netherlands on average not yet based on patient needs and sound theoretical basis (for instance including behavioural counselling techniques), but are based on demands perceived by suppliers. People with chronic diseases or those at risk, have only limited opportunities or perceive psychological barriers to engage in such exercise programmes and at sports clubs or fitness centres. Innovative special physiotherapists exercise programmes with focus on behavioural change in long term (from the Royal Dutch Society for Physical Therapy and developed by TNO) could better meet the expectations of inactive patients (as was found in the interviews with participating physiotherapists) but are not widely disseminated yet. There is a need for more good quality suppliers in the neighbourhood and a better system for reimbursement by health insurance companies.

From a Meta analysis [14] it is known that 17 referrals to exercise or physical activity programmes are needed to get ONE patient physically active in the long run. This is extremely disappointing. Apparently, mechanisms exist to keep patients away from helpful preventive and therapeutic interventions (also) in the area of type 2 Diabetes instead of encouraging them to exercise and PA. The patient profiles and the special developed physiotherapists programmes could be helpful to overcome barriers.

References:

1. Thomas DE, Elliott EJ, Naughton GA. Exercise for type 2 diabetes mellitus, Cochrane. Database Syst. Rev. 2007, 2:1 –41
2. U.S. Department of Health and Human Services Office of Disease Prevention & Health Promotion: 2008 Physical Activity Guidelines for Americans. Washington DC, USA,2008. http://www.health.gov/paguidelines
3. www.libraryindex.com/pages/723/Prevention-Disease-TERTIARY-PREVENTION.html
4. Marcus BH, Simkin LR. The transtheoretical model: applications to exercise behavior. Med Sci Sports Exerc. 1994, 26(11):1400-4.

5. Bandura A. Social foundations of thought and action: A Social Cognitive Theory, Prentice Hall, Englewood Cliffs, NJ; 1986.

6. Stiggelbout M, Hopman-Rock M, Crone M, Lechner L, van Mechelen W. Predicting older adults' maintenance in exercise participation using an integrated social psychological model. Health Educ Res. 2006, 21(1):1-14.

7. Hellénius ML, Eckerlund I. Methods for physical activity promotion. A systematic literature review from SBU. (Article in Swedish) Lakartidningen 2007, 104(37): 2592-6. (www.sbu.se for full abstract in English)

8. Kirk AF, Mutrie N, Macintyre PD, Fisher MB. Promoting and maintaining physical activity in people with type 2 diabetes. Am J Prev Med. 2004, 27(4):289-96.

9. Sørensen JB, Skovgaard T, Puggaard L. Exercise on prescription in general practice: A systematic review. Scand J Prim Health 2006, 24(2): 69-74.

10. Jongert MWA, Chorus AMJ, Stubbe JH, Stege JP, Pronk AM, van Hespen ATH. Patiëntprofielen [Patients profiles]. Leiden: TNO Quality of Life 2009. Report number 2008.127. www.tno.nl

11. Hespen van ATH, Jongert MWA, Chorus AMJ. Bewegen op Recept Diabetes type 2: Een kwalitatief onderzoek onder huisartsen en fysiotherapeuten [Exercise on Prescription Diabetes type 2: a qualitative study]. Leiden: TNO Quality of Life, 2009. Report number 2008.129. www.tno.nl

12. Estabrooks PA, Glasgow RE. Translating Effective Clinic-Based Physical Activity Interventions into Practice. Am J PrevMed 2006, 31:45-56.

13. Ainsworth BE, Haskell WL, Whitt MC, Irwin ML, Swartz AM, Strath SJ et al. Compendium of physical activities: an update of activity codes and MET intensities. Med Sci Sports Exerc. 2000, 32(9)Suppl:S498-S516

14. Williams NH, Hendry M, France B, Lewis R, Wilkinson C. Effectiveness of exercise-referral schemes to promote physical activity in adults: systematic review. Br J Gen Pract. 2007, 57(545):979-86.