

Diabetes em Movimento: a Portuguese web-based platform to support exercise prescription by medical doctors

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NAME OF THE MOBILE APPLICATION

Diabetes em Movimento – exercise prescription platform.

CATEGORY OF THE MOBILE APPLICATION

Health and fitness.

PLATFORM

Web-based, available at <http://www.diabetesem-movimento.com>.

COST

Free of charge, although restricted to medical doctors registered in Portuguese Medical Association.

ABOUT THE APP

Medical doctors can build a home-based exercise programme for patients with type 2 diabetes (T2D) by choosing exercises from a database of images and editing the basic exercise prescription parameters (weekly frequency, duration, sets, repetitions and intensity) of each exercise (figure 1). The exercise database has three aerobic exercises (walking-based), 32 resistance exercises (performed only with a chair, a pair of 0.5 L water bottles filled with sand and a gymnastics ball) and nine flexibility exercises. Videos of all the resistance exercises are also available and can be seen by medical doctors and patients at the office or at home. Several recommendations can be selected and incorporated into the exercise programme according to the diabetes comorbidities of each patient in order to prevent exercise-related adverse events,¹ such as assessing glycaemia before and after exercise, observing the feet and the socks before and after the exercise routine, using comfortable shoes, drinking water during exercise (minimum 0.5 L per hour), having something to eat if necessary, no breath-holding during exercises (Valsalva manoeuvre), avoiding head contact or shaking, avoiding walking on hard floors like asphalt, preferring clay, grass or tartan, and not using public swimming pools if foot ulcers or wounds are present. Exercise intensity is prescribed according to Borg's rate of perceived exertion scale (6–20 points), and the scale is also incorporated into the exercise programme. Three levels of exercise intensity are available for prescription: light (10–11 points), moderate (12–13 points) and vigorous (14–15 points). There are also three default exercise programmes that can quickly be selected with different exercise

volumes (basic, intermediate and advanced). It is also possible to fill out the patient's name and choose the duration of the programme (from 1 to 6 months). The final exercise programme (which includes images of all selected exercises) can be printed and given to the patient in a handout format or sent via email in PDF file format.

USE IN CLINICAL PRACTICE

Physical activity (PA) is one of the major risk factors for non-communicable chronic diseases (NCDs). Medical doctors play an important role in promoting PA and reducing sedentary behaviour to a broad segment of the population.² T2D is one of the NCDs that benefit the most from regular exercise. Most of this population is sedentary, although PA is included in all international strategies to control T2D.³ Age, anthropometric profile and diabetes comorbidities contribute to exercise prescription difficulty. Although originally created for a T2D context, this tool can be used to promote exercise for the management of any NCD and for the elderly population. This platform was developed under *Diabetes em Movimento*, a Portuguese community-based intervention programme designed to promote PA and lifestyle changes for patients with T2D.⁴ Web-based tools and technologies can greatly contribute to enhance PA participation, and home-based exercise programmes with low cost and high applicability exercise strategies can be prescribed in clinical settings with the support of this platform.

PROS

- ▶ Free of charge
- ▶ Web-based platform available in any mobile phone, tablet or personal computer
- ▶ Simple design and easy to navigate
- ▶ Low cost and high applicability exercise strategies with the use of everyday objects such as chairs and bottles of water
- ▶ Videos demonstrating the exercises
- ▶ Exercise intensity control and recommendations for exercise-related adverse events
- ▶ Exercise programme can be printed and given to the patient in a handout format or sent via email in PDF file format
- ▶ No advertisements.

CONS

- ▶ Restricted to medical doctors registered in Portuguese Medical Association

DIABETES EM MOVIMENTO
PLATAFORMA DE PRESCRIÇÃO DE EXERCÍCIO

SELEÇÃO DOS EXERCÍCIOS CONTACTOS HISTÓRICO

EXERCÍCIO AERÓBIO (3)

Aeróbio 1 Aeróbio 2 Aeróbio 3

EXERCÍCIO RESISTIDO (32)

Resistido 1 Resistido 2 Resistido 3

EXERCÍCIO DE FLEXIBILIDADE (9)

Flexibilidade 1 Flexibilidade 2 Flexibilidade 3

RECOMENDAÇÕES BÁSICAS

- Medir a glicemia antes e após sessões de exercício. Se tiver entre 100 e 300 mg/dL, pode iniciar o exercício; Se < 100 mg/dL deve comer antes de iniciar o exercício (1 pão OU 4 bolachas OU 1 peça de fruta OU 1 iogurte); Se > 300 mg/dL deve adiar a prática de exercício algumas horas e se os valores não baixarem deve procurar o seu Médico; No final do exercício se < 70 mg/dL deve comer de imediato.
- Observar sempre os pés e as meias, antes e depois da sessão de exercício, à procura de feridas ou outras lesões.
- Usar calçado desportivo confortável para caminhar.
- Beber água durante o exercício: no mínimo 0.5 L por hora.
- Levar sempre alguma coisa para comer, caso seja necessário.
- Fracionar a duração do exercício aeróbio em períodos mínimos de 10 minutos ao longo do dia.
- Evitar sustar a respiração durante a realização dos exercícios (manobra de Valsalva).
- Evitar contactos com a cabeça ou trepidações.
- Evitar caminhar em pisos duros, como cimento ou alcatrão. Dar preferência a pisos de terra batida, relvados, ou pistas de atletismo em tartan (borracha).
- Não utilizar piscinas públicas se tiver feridas ou úlceras.
- Tome nota num calendário de todas as sessões de exercício que realizar.

PROGRAMA DE EXERCÍCIO

Nome do doente Duração

EXERCÍCIO RESISTIDO

Resistido 1
Reforço Muscular dos membros superiores e tronco.
Frequência semanal: 1 dia por semana
Séries: 1
Repetições: 15
Intensidade: 10-11 pontos Escala Borg
Observações: [Apagar] [Editar]

EXERCÍCIO FLEXIBILIDADE

Flexibilidade 2
Alongamento dos membros inferiores e tronco
Frequência semanal: 1 dia por semana
Repetições: 2
Duração: 10 segundos
Observações: [Apagar] [Editar]

ESCALA DE BORG

6	Sem nenhum esforço
7	Extremamente leve
8	
9	Muito leve
10	LEVE
11	Leve
12	MODERADO
13	Um pouco intenso
14	VIGOROSO
15	Intenso
16	
17	Muito intenso
18	
19	Extremamente intenso
20	Máximo esforço

Observações

O exercício físico não dispensa a adoção de um estilo de vida saudável e a toma correta da medicação habitual;
No caso de sentir dor ou desconforto durante a realização de algum exercício, consulte o seu Médico;
Os programas de exercício físico são mais eficazes e mais seguros se forem monitorizados por um Técnico de Exercício Físico.

PRÉ-VISUALIZAR GUARDAR

Annotations:

- 1 Fill out patient's name
- 2 Define exercise program duration
- 3 View all available exercises (aerobic, resistance and flexibility)
- 4 Select exercises
- 5 Edit exercise prescription parameters (weekly frequency, intensity, series, repetitions and duration)
- 6 Review all selected exercises
- 7 Select recommendations for the prevention of exercise-related adverse events in accordance with diabetic comorbidities
- 8 Explain Rate of Perceived Exertion Scale (6-20 points) to the patient and the three major exercise intensity levels: light, moderate and vigorous
- 9 Review some basic safety measures with the patient
- 10 Save and print the exercise program giving it to the patient in a handout format or sending it via e-mail in PDF format

Figure 1 General vision of Diabetes em Movimento—exercise prescription platform.

- ▶ Only in Portuguese language
- ▶ Internet access is always required.

Contributors All authors were involved in the web-based platform design. RM and JLTB wrote the paper. NS, MA and VMR reviewed and approved the paper.

Competing interests None declared.

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