

NORDIC WALKING FOR PATIENTS OF TYPE II DIABETES MELLITUS: A CRITICAL REVIEW

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Abstract

Nordic walking (NW) is a particularly health-friendly type of physical activities. Sessions of NW are carried outdoors in “a natural sports hall”. (Upeniece I.2013) Adequate doses of physical activities are a compulsory part of treatment for patients of Type II Diabetes Mellitus. Several research have confirmed the positive effects of physical activities for this particular group of patients. Three of the included works of research (Fritz et al, 2013; Fritz et al, 2011; Gram et al, 2010) had a set research quality in the PEDro database, and it corresponded to high quality (6 points out of 10). All included works of research are randomised controlled works of research. NW activities for 4 months under the supervision an instructor substantially decrease the total amount of fat for patients with Type II Diabetes Mellitus and this reduction also lasted for one year after the sessions. NW activities for 4 months have improved sleep quality and the overall increase of physical activities, which represents a significant element of treatment and preventive measures for patients of Type II Diabetes Mellitus. NW the course is offered RSU students of medicine, rehabilitation Faculties. The increasing interest about NW in the schools for all ages group.

KEYWORDS: Nordic walking, patients, Type II Diabetes Mellitus.

Introduction

Nordic walking is a particularly health-friendly type of physical activities. Sessions of Nordic walking are carried outdoors in “a natural sports hall” and Nordic walking is becoming more and more popular in Latvia and abroad. (Upeniece,2013) Motherland of Nordic walking is Finland. (Arem ,2006) It may seem rather easy, however, it is important to learn proper techniques, to choose adequate equipment and to comply with correct methodology of sessions. Due to the application of correct methodology a great part of muscles (90%) is involved thus forming biomechanically correct movements. ” (Svensson ,2009). Adequate doses of physical activities are a compulsory part of treatment for patients of Type II Diabetes Mellitus. Several research have confirmed the positive effects of physical activities for this particular group of patients. As a result of physical activities cardiovascular risks diminish (hypertension, dyslipidemy, fat accumulation etc.), the sensitiveness of insulin increases.(Meterniha,2010)

Objective of the research

The objective of the research is to summarise proof available in sources about the effectiveness of Nordic walking in the improvement of health indicators for patients of Type II Diabetes Mellitus.

Material and Methods

The following online databases were used as sources for data collection: *PudMed* and *Cochrane Library*. The selection of research was performed on the basis of key words “Nordic walking”, “Type II Diabetes Mellitus” and “Nordic Walking and Diabetes” and the year of publishing (that is, from 2003 till 2013). The next step was the selection of research that corresponded to the theme, according to the title and duplicates were excluded; research that are not in English, systematic research reviews and case analysis and incomplete text research were not chosen, too. Those research that examined Nordic walking for patients of Type II Diabetes Mellitus corresponded to the selected theme. Research that did not fit in to the theme referred to other groups of patients (clients) or used other types of intervention. The next step was a review of research summaries with an aim to select the ones that correspond to the set inclusion criteria.

The selected research were included for further summarisation and analysis, taking into account the inclusion criteria that were chosen according to PRISMA recommendations. Randomly controlled research were also included, where the experimental group practised Nordic walking according to specific methodology and the results were compared with the control group. Works of research in which Nordic walking was combined with other types of intervention or compared with other kinds of intervention groups were not included. Works of research that used standardised measurements for the assessment of

effectiveness were included. Research that examined patients of Type I Diabetes Mellitus or other types of target population were excluded from this research.

The quality of research was evaluated on the basis of quality assessment available in PEDro database. This scale has been established in order to assess the quality of research; it consists of 11 points and the maximum assessment is 10 points. One point is given for the correspondence with each criterion, but the correspondence of the research itself is not evaluated according to the points; therefore the maximum number is 10 on the 11-points scale. The instrument can be applied to two quality aspects: reliability and the interpretation possibilities of the research. Reliability is evaluated according to random and hidden selection, the initial comparability, unknown participants, therapists and evaluators, adequate examination and the analysis of "intention to treat". The question whether the research can be interpreted is assessed according to the comparativeness of groups and changes in the report on points and calculations. The last time when the scale was changed was on 21 June 1999.

Results of the research

Initially, 10 research were identified on the basis of the chosen key words and the year of publishing. After reviewing the summaries of the initially chosen works of research, the following ones were excluded: the works of research that were not written in English, systematic research reviews and case analysis. 6 works of research corresponded to the themes, out of which copies were excluded. From the selected works of research 3 corresponded to the inclusion criteria and they were included in the systematic review.

Three of the included works of research (Fritz et al, 2013; Fritz et al, 2011; Gram et al, 2010) had a set research quality in the PEDro database, and it corresponded to high quality (6 points out of 10). All included works of research are randomised controlled works of research.

The number of participants

One research (Fritz et al, 2011) involved a total of 212 participants (118 women and 94 men; the experimental group n=87; the control group n=125), while another research of the same author (Fritz et al, 2013) involved a total of 213 participants (patients of Type II Diabetes Mellitus n=50, patients with glucose tolerance disturbances n=35, normal glucose tolerance n=128; the experimental group consisted of 87 participants; the control group n=126). The third research (Gram et al, 2010) involved a total of 68 patients with Type II Diabetes Mellitus (37 men, 31 women; the experimental group (the Nordic walking group) n=22, the control group n=22, the exercises group n=24).

Methodology of Nordic Walking

In two works of research (Fritz et al, 2011; Fritz et al, 2013) Nordic walking activities were organised as independent sessions (unsupervised, however, prior to the session the participants were instructed verbally about the methodology of Nordic walking); the sessions consisted of 5 hours activities each week for a 4 months period. At the beginning trainers gave the instructions and requested the participants to fill in a diary about the performed activities. In one research (Gram et al, 2010) Nordic walking activities were carried out under supervision twice a week for 2 months and once a week during the following 2 months; the duration of each session was 45 minutes (10 minutes of warming up, 30 minutes of Nordic walking and 5 minutes of finishing exercises), the intensity is at least average (>40% of the maximum VO₂). The activities were conducted by a physiotherapist and there was a recommendation to get involved in other physical activities apart from these sessions.

Intervention of the control group

No intervention was applied for the participants of the control group in two works of research (Fritz et al, 2011; Fritz et al, 2013), while in the research of Gram et al (2010) the participants of the control group received written information about the role of physical activities in the treatment of Type II Diabetes Mellitus.

Changes in health indicators as a result of Nordic walking

In both works of research (Fritz et al, 2011; Fritz et al, 2013), in which unsupervised Nordic walking activities were carried out, minutes about the levels of activities were taken (a subjective assessment of

physical activities for a period of 6 months prior the research and during the research (the visual analogue scale); a dairy; an accelerometer for 7 days (n=25 in each research)).

- Anthropometrical indicators

The body's mass index (BMI) analysis was performed in all three works of research prior to and after the intervention for patients of Type II Diabetes Mellitus. In two works of research (Fritz et al, 2011, Gram et al, 2010) a substantial reduction of the BMI was not stated, in one research (Fritz et al, 2013) the BMI substantially ($p < 0.05$) decreased after Nordic walking activities, however a reliable difference from the changes in indicators of the control group were not observed.

One research (Gram et al, 2010) analysed the total amount of the body's fats (by applying the X-ray densitometric method), and it was stated that after 4 months it decreased substantially ($p = 0.021$) in comparison with the control group; and this difference was also observed after one year ($p = 0.014$).

- Biochemical indicators

Two works of research (Fritz et al, 2013, Gram et al, 2010) analysed several biochemical indicators: one research confirmed a reliable decrease ($p < 0.05$) of *glycated haemoglobin* after Nordic walking activities, however, it was not significant different from changes in the control group; the second research also did not confirm a significant difference between the Nordic walking group and the control group according to the changes of indicators of glycated haemoglobin. Both works of research did not state reliable changes of lipids (cholesterol, low density lipoproteins, high density lipoproteins) in comparison with the control group.

- Maximum consumption of oxygen

The maximum consumption of oxygen was analysed in two works of research (Fritz et al, 2013, Gram et al, 2010) and no significant improvements in comparison with the control group were stated.

- Health-related life quality

Health-related life quality was analysed in two works of research (Fritz et al, 2011, Gram et al, 2010). In one research a Swedish questionnaire on health-related life quality was used (SWED-QUAL), but the other research used the SF-36 questionnaire. The research of Fritz et al (2011) showed that after 4 months of Nordic walking activities the increase of physical activities ($p = 0.0047$) was higher than the indicators for the control group; and it also revealed an improvement in sleep quality ($p = 0.0312$). The research of Gram et al (2010) did not demonstrate significant reliable changes in measurements of life quality (according to SF-36) after four months, as well as the amount of overall physical activities did not increase.

The data about changes in health indicators as a result of Nordic walking activities are summarised in Table 1.

Table 1. Changes in health indicators as a result of Nordic walking

		Fritz et al 2011	Gram et al 2010	Fritz et al 2013
Anthropometric indicators	Body Mass Index ($p < 0.05$)	No reliable changes were stated		No difference from the control group
	Body's total amount of fat ($p = 0.021$)		Retained also after 1 year ($p = 0.014$)	
Biochemical indicators	Glycated haemoglobin ($p < 0.05$)		No difference from the control group	No difference from the control group
	Cholesterol, low density lipoproteins, high density lipoproteins		No reliable changes were stated	
Max O2 consumption			No substantial improvements	
Life quality				
SWED-QUAL	Physical activities	↑ ($p = 0.0047$)	-	-
	Sleep quality	↑ ($p = 0.0312$)		
SF-36	Physical activities and other domains	-	No substantial improvements	-

Discussion

Nordic walking is a type of physical activities that is becoming more and more popular in the society. Nordic walking can be applied both for the promotion and maintenance of health, and for the preventive measures and the treatment of illnesses. The analysis of research sources demonstrates that the activities of Nordic walking are organised in various ways – both as supervised and controlled activities under the management of an instructor or as independently organised physical activities of individuals. The peculiarities of this methodology should be taken into account when interpreting the acquired results in the works of research. Another important aspect is the amount of load that influences the changes in health indicators independently from the chosen type of physical activities.

Although the works of research confirmed the improvement of glycemia control, it still was not higher than the control indicators (that is, Nordic walking did not demonstrate a higher positive effect in comparison with other types of physical activities). However, if one takes into account the popularity of Nordic walking, it promotes a higher level of participation of individuals, thus substantiating the advantages of Nordic walking. I would like to emphasise the positive influences of Nordic walking on such indicators as sleep quality and the level of general physical activities that represent an important component of life quality.

Conclusions

1. One high quality RCT (randomly control trial) confirms that Nordic walking activities for 4 months under the supervision an instructor substantially decrease the total amount of fat for patients with Type II Diabetes Mellitus and this reduction also lasted for one year after the sessions.
2. There is no proof that Nordic walking activities would reduce the body's mass index (BMI), the level of glycated haemoglobin or the level of lipids for patients of Type II Diabetes Mellitus.
3. One high quality RCT (randomly control trial) confirms that unsupervised Nordic walking activities for 4 months have improved sleep quality and the overall increase of physical activities, which represents a significant element of treatment and preventive measures for patients of Type II Diabetes Mellitus.

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S u m m a r y

Nūjošana ir sevišķi draudzīgs cilvēku veselībai fizisko aktivitāšu veids. Nodarbības notiek „dabas sporta zālē” un kļūst arvien populārākas Latvijā un ārvalstīs. Nūjošanas (no angļu valodas: Nordic walking) dzimtene ir Somija. Nūjošana var šķist gana vienkārša, taču nepieciešams iemācīties pareizu tehniku, izvēlēties atbilstošu ekipējumu un ievērot pareizu nodarbību metodiku. Pateicoties pareizai tehnikai pielietošanai, tiek nodarbināta liela muskuļu daļa (90%), veidotas biomehāniski pareizas kustības. Adevkāti dozētas fiziskās aktivitātes ir neatņemama 2.tipa cukura diabētu pacientu ārstēšanas sastāvdaļa, vairāki pētījumi ir apliecinājuši fizisko aktivitāšu pozitīvos efektus dotajai pacientu grupai. Fizisko aktivitāšu ietekmē samazinās kardiovaskulārie riski (hipertensija, dislipidēmija, tauku akumulācija u.c.), paliecinās insulīna jutībā Trijiem no iekļautajiem pētījumiem (Fritz et al, 2013; Fritz et al, 2011; Gram et al, 2010) bija noteikta pētījuma kvalitāte PEDro datubāzē un tā atbilda augstai kvalitātei (6 balles no 10). Visi trīs iekļautie pētījumi ir randomizēti kontrolēti pētījumi. Viens augstas kvalitātes RCT apstiprina, ka četru

mēnešu nūjošanas nodarbības fizioterapeita vadībā būtiski samazina ķermeņa kopējo tauku daudzumu pacientiem ar 2.tipa CD un šis samazinājums saglabājas arī 1 gadu pēc nodarbībām. Nav pierādījumu tam, ka nūjošanas aktivitātes samazinātu ĶMI, glikolizētā hemoglobīna vai lipīdu līmeni pacientiem ar 2 tipa CD. Viens augstas kvalitātes RCT apstiprina nepārraudzītu četru mēnešu nūjošanas aktivitāšu efektivitāti uz miega kvalitātes uzlabojumu un kopējo fizisko aktivitāšu pieaugumu, kas ir būtisks 2.tipa cukura diabēta pacientu ārstēšanas un profilakses elements. Nūjošanas kurss tiek piedāvāts Rīgas Stradiņa Universitātes medicīnas, rehabilitācijas un ārvalstu fakultātēs studentiem. Arvien lielāka interese par nūjošanu ir Latvijas skolās visās vecuma grupās.