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Contributions of physiotherapy in primary care for the reduction of diabetic comorbidities

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Abstract: Diabetes Mellitus is a metabolic syndrome characterized by increased blood glucose levels. This happens due to the lack or malfunction of the hormone responsible for the absorption of glucose, insulin. DM can also be characterized by deficit of other energy sources, causing several complications in vital organs. This study has as general objective to present therapeutic interventions to reduce diabetic comorbidities. The article was carried out through a literature review, information was collected in the databases: Pubmed/Medline, Scielo, LILACS and Google Scholar. Forty results were included presenting different study designs, totaling 46 individuals studied and diagnosed with diabetes mellitus and a narrative review with 10 articles analyzed, explaining different results in order to reduce and prevent comorbidities that can be developed by the disease. This study shows efficacy in the work of the physiotherapist, in the multidisciplinary team, focused on diabetic patients, especially in the prevention of the disease, in the treatment and prevention of complications. It is necessary to indicate those with higher risks of complications and offer more adequate assistance.

Keywords: diabetic complications, physiotherapy.

1. Introduction

Diabetes Mellitus (DM) has been a prevalent public health problem, due to the high rates of morbidity and mortality and high rate of complications that affect individuals in psychological, social and economic aspects, thus directly impacting the quality of life of patients and their families. DM is a disease already considered endemic; in Brazil it is estimated 11 million diabetic people by the year

2025 (BARROS. *et al.* 2012).

DM is a metabolic syndrome characterized by increased blood glucose levels. This happens due to the lack or malfunction of the hormone responsible for the absorption of glucose, insulin. DM can also be characterized by deficit of other energy sources, causing several complications in vital organs (WICHNIESKI. *et al*. 2015).

Complications of DM include vascular and neurological alterations, nephropathy, neuropathy, retinopathy, amputations, Charcot arthropathy, among others. In recent years numerous complications of DM have generated high costs for the government. The health professional with his multidisciplinary team has the role of educating, caring for and preventing complications such as these, in order to reduce the demand in hospitals and improve the quality of life of the individual (FREIRE. *et al*. 2015).

It is a fundamental role of the physiotherapist to support the treatment of patients with DM, encouraging them to practice physical activities, helping them to promote changes in lifestyle, as well as the reduction/abolition of alcohol, tobacco, sedentary lifestyle, alerting them about the harms of the disease and the importance of treatment (DA SILVA; GARDENGHI, 2019).

Early treatment of DM decreases the chances of morbidity and mortality, the duration of the disease and the age of the individual (elderly) are directly associated with reduced function, so the importance of the physiotherapist in the prevention of comorbidities, improvement in body awareness and functional independence (SILVA; GARDENGHI, 2019).

In view of the above, the general objective of this study was to present therapeutic interventions to reduce diabetic comorbidities.

2. Methodology

The article was carried out through a literature review, information was collected in the databases: Pubmed/Medline, Scientific Electronic Library Online (Scielo) and International Literature in Health Sciences (LILACS) and Google Scholar. Articles related to the theme "Contributions of Physiotherapy in Primary Care to Reduce Diabetic Comorbidities: Integrative Literature Review" were selected. The following search terms were used: Diabetic Complications, Physiotherapy, Diabetic Complications, Physical Therapy Specialty. The search was conducted from September 2020 to June 2021 and publications were included only in English and Portuguese. We analyzed 10 articles based on the most current articles for the elaboration of the project, the articles were independently evaluated by five researchers. The selection of articles was based on inclusion criteria: only scientific articles, articles related to physiotherapy and articles that indicated access to health services for the care of diabetic patients. Exclusion criteria for the study were: monographs, dissertations and doctoral theses.

3. Results and Discussions

In this study of integrative literature review, four articles that met the established inclusion criteria were analyzed. All selected according to the following flowchart.

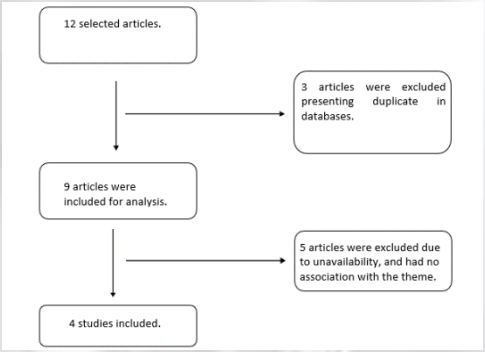

Figure 1. Strategic flowchart of selection of articles by databases. Source: Search Data

According to the selected articles, the physical therapist's performance is fundamental in patients with DM and performed in a way that decreases the chances of morbidity and mortality. (Table 1)

Table 1. List of references that addressed the physical therapist's performance in basic health units in patients with DM, according to author, year, article title, study design, journal, sample size and results.

author (Year)	title of the article	drawing of the study	periodic	sample	findings
Freire et al (2015)	Implementation of physiotherapeutic actions in the prevention of complications of diabetes in the Family Health Strategy	Descriptive objective study	Physiotherapy in movement	17 Patients	Patients with deformities, dry skin, calluses, dehydration, ulceration, cracks and brittle nails with altered tactile sensitivity in the heel region. There was a decrease in functionality in ankle movements, 76% were sedentary and 24% knew the benefits of regular physical exercise; 25% of subjects underwent medical evaluation before performing physical exercise

Table 2. List of references that addressed the physical therapist's performance in basic health units in patients with DM, according to author, year, article title, study design, journal, sample size and results.

author (Year)	title of the article	drawing of the study	periodic	sample	findings
WICHNIESKI et al (2015)	Physiotherapeutic intervention in peripheral arterial disease by functional hyperemia in diabetic patients	Exploratory qualitative case study	Physiotherapy in movement	5 patients	It was verified that there was a significant increase in the means of uptime (F 9.36 = 13,710; p = 0.000), distance of the course (F 9.36 = 27,689; p = 0.000) and speed (F 9.36 = 15,638; p = 0.000). In the evaluation of the ankle/brachial index, no specific differences were observed.

Table 3. List of references that addressed the physical therapist's performance in basic health units in patients with DM, according to author, year, article title, study design, journal, sample size and results.

author (Year)	title of the article	drawing of the study	periodic	sample	findings
Barros et al (2012)	Impact of physiotherapeutic intervention in the prevention of diabetic foot	Intervention study	physiotherapy of the movement	24 Patients	After the intervention, there were changes in relation to the habit of walking withoutshoes, dry the feet correctly, began to use appropriate footwear, use therapeutic massage on the feet and began to moisturize them properly. The intervention had a relevantimpact ,todos users considered beneficial the exercises for the feet becoming a frequent habit.

Table 4. List of references that addressed the physical therapist's performance in basic health units in patients with DM, according to author, year, article title, study design, journal, sample size and results.

author (Year)	title of the article	drawing of the study	periodic	sample	findings
Silva et al	Physiotherapy performance in Diabetic patients		Narrative Review	10 Articles Analyzed	The performance of physiotherapy through physical exercises when effectively contribute to improved quality of life and lower incidence of dm increase.

In this review article, 04 studies were included presenting different study designs, totaling 46 individuals studied and diagnosed with diabetes mellitus and a narrative review with 10 articles analyzed, explaining different results in order to reduce and prevent comorbidities that can be developed by the disease.

Patients with DM may present with a number of complications in the lower limbs, affecting functionality and consequently quality of life. In the study by Socco, *et a*l, 2007, the authors say that in diabetic neuropaths there is a reduction in sensitivity, especially in the heel region, decreased muscle strength, range of motion and functionality of the ankle joint. The reductions in functionality, sensory and musculoskeletal contribute to the reduction of quality of life and to the appearance of other problems such as plantar ulcers. Prevention is an important point and should be oriented to avoid future complications.

The performance of physical activities is extremely important for the prevention of comorbidities that can be developed in individuals diagnosed with DM. Artioli; Sá Filho, 2016, explain in their study that therapeutic physical activity provides improvement in glycemic levels in the short term and functional capacity. In a program of supervised therapeutic physical activities, only one session per week would already present improvements in glucose uptake sensitivity and also functional capacity.

In one of the selected studies, patients diagnosed with diabetic foot were evaluated, presenting positive results in intervention and prevention. According to Mendonça; Morals; Moura, 2011, some measures such as a good evaluation, a regular follow-up by trained professionals and awareness about the care to be taken with the feet, can reduce and prevent other aggravating problems arising from diabetes mellitus. Rosa, et al, 2020, corroborate that, even though it is a chronic disease, it is possible that the comorbidities of diabetic foot are decreased and avoided through health education measures, aiming to prevent and promote health in general.

Exercise is one of the most effective ways to achieve an improvement in quality of life and decrease diabetes. Paludo, et al, 2018, in their study, says that the prescription of physical exercises, both of moderate intensity and high intensity, becomes an important point for improving the quality of life of people with diabetes mellitus.

Therefore, Marçal, et al, 2018, says that other types of exercises such as Pilates and resistance exercise, have efficacy with regard to the clinical and metabolic control of the disease. Silva, *et al*,2020, add that practicing physical exercise for people with diabetes mellitus is important, because it maintains glycemic homeotase and improves quality of life.

Macedo, et al, 2019, reports that among the benefits of physical activity can be found the increased action of insulin, increased glucose uptake by the musculature, decreased blood glucose and increased cellular sensitivity to insulin, reduction of body fat, which contributes to the quality of life of individuals practicing physical activities.

According to Silva, *et a*l,2012, diabetes mellitus is a chronic disease characterized by altered blood glucose, followed by some complications. Diabetic foot is one of these complications developed by innervation deficiency in the lower limbs due to diabetic neuropathies. Physiotherapy acts through actions that minimize sequelae from diabetic foot.

The physiotherapist plays an important role in the treatment of diabetes mellitus and a vast field to act in the care of diabetic patients. Portes, 2015, says that the physiotherapist is fundamental in the integration of multidisciplinary teams focused on the care of patients with chronic diseases in the treatment and secondary prevention of comorbidities of Diabetes Mellitus and also for health promotion related to the stimulation of healthy habits to prevent other health problems, including Diabetes Mellitus.

4. Conclusions

This study shows efficacy in the work of the physiotherapist, in the multidisciplinary team, focused on diabetic patients, especially in the prevention of the disease, in the treatment and prevention of complications. Dependent on the stage of the disease, it can cause loss or decrease in functions, neurological manifestations and loss of strength and musculoskeletal range of motion, which may cooperate to reduce quality of life, resulting in the aggregation of other associated pathologies and limitations or restrictions.

It is necessary to indicate those with higher risks of complications and offer more adequate assistance. However, in view of all patients, it is essential that the physiotherapist, together with the team, perform a reasoned evaluation, regular supervision, increased information on foot care, and ensure that they are oriented in the best way about other measures that can avoid complications resulting from Diabetes Mellitus.

In addition, the orientation to perform physical exercises, such as aerobic exercises and resistance exercises, from moderate to high intensity, according to the functional capacity of the patient, shows efficacy in improving the quality of life in diabetic patients.

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