Original Article

Diabetes mellitus: risk factors for nursing workers*

Diabetes mellitus: fatores de risco em trabalhadores de enfermagem

Diabetes mellitus: factores de riesgo en trabajadores de enfermería

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ABSTRACT

Objectives: To identify risk factors for type 2 diabetes mellitus, among nursing workers at the State Institute of Diabetes and Endocrinology Luiz Capriglione. **Methods:** This is a cross-sectional study in which were applied two data collection instruments that included open and closed questions related to the health status and lifestyle of 100 nursing staff of the health institution. Also the biochemical and anthropometric nature of data were verified. **Results:** The results confirmed the occurrence of reversible major risk factors, emphasizing physical inactivity and obesity. **Conclusion:** Developing actions aimed at promoting health is considered important, focusing on prevention of chronic diseases and conducted in their own work environment.

Keywords: Nursing staff; Diabetes mellitus, type 2; Risk factors; Health of the worker

RESUMO

Objetivos: Identificar os fatores de risco para o diabetes mellitus tipo 2, entre trabalhadores de enfermagem do Instituto Estadual de Diabetes e Endocrinologia Luiz Capriglione. **Métodos:** Estudo transversal com aplicação de dois instrumentos de coleta de dados que incluíram questões abertas e fechadas relativas ao estado de saúde e estilo de vida de 100 trabalhadores de enfermagem dessa instituição de saúde. Foram ainda verificados dados de natureza bioquímica e antropométrica. **Resultados:** Os resultados confirmaram a ocorrência de importantes fatores de risco de natureza reversível, destacando-se o sedentarismo e a obesidade. **Conclusão:** Considera-se a importância do desenvolvimento de ações visando a promoção da saúde com enfoque na prevenção de doenças crônicas, a serem realizadas no próprio ambiente de trabalho.

Descritores: Saúde do trabalhador, Recursos humanos de enfermagem; Diabetes mellitus tipo 2; Fatores de risco

RESUMEN

Objetivos: Identificar los factores de riesgo para la diabetes mellitus tipo 2 entre trabajadores de enfermería del Instituto Estatal de Diabetes e Endocrinología Luiz Capriglione. **Métodos:** Se trata de un estudio transversal con aplicación de dos instrumentos de recolección de datos que incluyeron preguntas abiertas y cerradas relacionadas al estado de salud y estilo de vida de 100 trabajadores de enfermería de esa institución de salud. Fueron también verificados datos de naturaleza bioquímica y antropométrica. **Resultados:** Los resultados confirmaron la ocurrencia de importantes factores de riesgo de naturaleza reversible, destacándose el sedentarismo y la obesidad. **Conclusión:** Se considera importante desarrollar acciones que tengan por objetivo la promoción de la salude con enfoque en la prevención de enfermedades crónicas, a ser realizadas en el propio ambiente de trabajo.

Descriptores: Personal de enfermería; Diabetes mellitus tipo 2; Fatores de riesgo; Salud del trabajador

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** Study developed in the Luiz Capriglione State Institute of Diabetes and Endocrinology of the State Health Secretariat of Rio de Janeiro, located in Rio de Janeiro.*

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INTRODUCTION

This paper presents part of the data from a study that resulted in the masters dissertation entitled: Risk factors for type 2 diabetes mellitus and the actions of self-care among nursing staff[1]. The research sought to address issues related to the theme "nursing staff health", addressing issues involved in the health-disease process related to chronic diseases, particularly type 2 diabetes mellitus.

In recent years, studies conducted in the area of nursing staff health have enabled better recognition of the different risk factors that jeopardize the health of these workers, whether physical, biological, mechanical or ergonomic. Added to these factors, low remuneration could also be considered, which frequently leads to maintenance of multiple work contracts[2-3], favoring physical and emotional attrition that contributes to a lower quality of life, and increases the risks of iatrogenic diseases and accidents at work[2].

In addition to the known diseases related to the working world, there is also a wide "spectrum of diseases less visibly linked to work", among them are chronic non-transmissible diseases, also known as chronic degenerative diseases, where the interrelationship is much less apparent[4].

Some studies[5-9] have been performed attempting to identify links between the emergence of chronic degenerative diseases and the world of work, but it is still difficult to establish the trends of these diseases over time and correlate them with changes in work[4]. It is known that at the beginning of the last century non-communicable chronic diseases (NCCD) were more frequent among the higher income classes. Today, conversely, they tend to focus mostly on population groups of lower income, lower education levels and poorer living conditions[10].

The work environment and organization participate in the favoring of occurrences of this nature, through mechanisms linked to stress and other interferences in the lifestyle pattern[10]. The hospital, as a work space, is no exception to this association.

Studies are still needed on the health conditions of this group of workers, considering the complexity of the relationships between health and work, in order to extrapolate the traditional view of occupational health. Some authors indicate that the excessive workload and high level of stress, would make them vulnerable to effects on physical and emotional integrity[2,11-12] and also consider that these factors predispose the accession of inappropriate practices such as smoking, alcoholism and excessive food consumption.

As in the general population, nursing staff are subject to a number of influences arising from the environment in which they live and work. It is not difficult to conjecture that such influences can produce negative interferences in the lifestyle and, consequently, in the actual standard of self-care, thus contributing to the establishment of risk factors for a number of diseases, particularly chronic degenerative diseases, including cardiovascular disease and type 2 diabetes.

Along these lines, a study conducted in 2005[13] in Rio Grande do Sul sought to analyze which risk factors for coronary heart disease could be identified among nursing staff. The population included 209 workers in a general hospital of the city. The survey revealed that, of these, 19.1% were considered stressed (when subjected to application of the questionnaire "Briel Stress and Coping Inventory-Briel SCI"), 29.7% proved to be hypertensive and 27.7% reported total cholesterol values >200mg/dl. The auxiliary nurses presented higher body mass indices (BMI) and stress levels, while the nurses presented higher blood pressure levels. Sedentary lifestyles were identified in more than half of the sample. These findings confirm the existence of risk factors relevant to a number of chronic diseases.

Another study[14] carried out in the same city in 2009, sought to investigate the same risk factors, this time with the nursing staff who worked in the Emergency Unit, Obstetric Center, Surgical Center and Intensive Care Unit (Pediatric, Adult, Neonatal). The aim was to correlate the results of risk factors among nursing categories, work shifts, and the respective sectors in which they worked.

To evaluate the level of stress, the researchers used the instrument "Lipp's Stress Symptoms Inventory for Adults". These tests were analyzed by a duly qualified psychologist, and classified according to the stage displayed: alarm, resistance, near exhaustion and exhaustion.

Risk factors prevalent in the sample were having a family history, present in 86.3% of the workers, and a sedentary lifestyle, referred to by 55% of the group. High and borderline cholesterol levels were found in 6.3% and 26.3% of participants respectively, elevated triglyceride levels were identified in 1.3% and borderline values were exhibited by 8.8% of them. Regarding BMI, 56.3% of the sample ranged between overweight and obese, confirming an increased risk for cardiovascular disease CVD in 75%, when subjected to the verification of measurement of abdominal circumference. Finally, a high level of stress was evidenced in 53.8% of the workers.

Regarding the correlation of the risk factors in relation to the professional categories, the results showed no statistically significant differences, highlighting, however, that the total cholesterol value was higher among auxiliary nurses. Given the similarity of results with other studies

conducted with nursing staff, the authors considered the importance of continuity of studies of this nature in order to better understand the quality of health of these workers and the relationship between these health problems and the work process.

Risk factors for chronic diseases in general, can be classified into reversible and irreversible. In the case of type 2 diabetes, a chronic disease with greater prevalence in recent years, five irreversible risk factors can be identified from the Brazilian Consensus on Diabetes[15]: age, family history of diabetes mellitus, occurrence of gestational diabetes, history of fetal macrosomia and the occurrence of recurrent spontaneous abortions or perinatal mortality.

Among the reversible risk factors, i.e. those possible to prevent or control there are: excessive weight (BMI³ 25 kg/m2), physical inactivity, low levels of high-density lipoprotein cholesterol HDL-C or high triglyceride levels, arterial hypertension and the use of hyperglycaemic medication (e.g. corticosteroids, thiazide diuretics, beta-blockers).

Additionally, other associated conditions also deserve mention. Although not listed in the previously mentioned Consensus but which deserve careful attention are: the dietary pattern[10] and increase in the abdominal circumference (abdominal circumference values³ 102 cm in men and ³ 88cm in women), the latter is closely associated in the literature[16] to insulin resistance and metabolic syndrome, recognized risk factors in the genesis of NCCD. Thus, the objective of this part of the study was to identify risk factors for type 2 diabetes mellitus among nursing staff at the Luiz Capriglione State Institute of Diabetes and Endocrinology.

METHODS

The aim of this cross-sectional study was to gather data with a view to diagnosing the situation of nursing professionals in relation to risk factors for type 2 diabetes. Although not intended to be extrapolated to other groups, it allowed the raising of questions on the theme of nursing staff health that could support other studies.

The study was conducted among a group of nursing staff, of an institution that provides assistance to patients with endocrine disorders, located in Rio de Janeiro, and was initiated after approval of the protocol by the Research Ethics Committee of the Institutional. The study population consisted of a 134 nursing professionals. The sample consisted of 100 workers, representing 75% of the population. All participants had performed their functions in the unit for at least two years. Data collection occurred during the period from October 2003 to March 2004. This phase consisted of three stages.

The first stage was initiated after the signing of the free prior informed consent form and consisted of the identification of participants and verification of the anthropometric data. The second stage was characterized by the application of two instruments: instrument 1, was a form with open and closed questions, divided into five parts: identification (consisting of socio-demographic data); anthropometric and biochemical data (consisting of data on weight, height, and abdominal circumference - fasting plasma glucose, triglycerides, total cholesterol and HDL-C); evaluation of knowledge regarding risk factors for developing diabetes; health status and identification of self-care practices related to lifestyle. Instrument 2 was a questionnaire developed by the Harvard-Joslin-SBD, entitled "Is it possible you have diabetes and do not know?"[17], which identifies the level of risk for the occurrence of type 2 diabetes at the time.

The third stage consisted of the verification of the biochemical data (fasting glucose, triglycerides, total cholesterol and HDL-C) obtained by collecting and analyzing blood samples, performed in the laboratory of the institution. This last stage was not completed for all, since at the end of the period of data collection, 18 participants had still not undergone blood collection.

To tabulate the data the program EPI-INFO-version 6.04 (January.2001) was used, which was developed by the *U.S. Department of Health and Human Services-Public Health Service-Center for Disease Control and Prevention*. For the analysis, the simple descriptive statistics technique was used, understood as the distribution of absolute and relative frequencies, seeking an examination of trends of the variables.

RESULTS

Female workers were represented more, as was expected. Of the 100 workers participating in the survey, 88% were female. The mean age of respondents was 44 years, with the minimum age of 25 years and maximum 69 years. Of the total participants, 49% were part of the group considered high risk, 43% of the low risk group, and 8% of the group considered without risk at that moment (Table 1).

Regarding risk factors for the occurrence of the disease, those identified were: physical inactivity (81%); BMI ≥25 kg/m² (55%); age ≥45 years (41%); increased abdominal circumference (35%); family history of diabetes (first-degree kinship) (16%); family history of diabetes (second-degree kinship) (20%); family history of diabetes (first and second degree kinship simultaneously) (20%); hypertension (24%); history of fetal macrosomia (6.8%) and history of gestational diabetes (1.1%) (Table 2).

Table 1 - Nursing staff distribution according to risk levels for diabetes mellitus – 10/2003 to 03/2004

Risk level, at the time	n	%
High risk	49	49.0
Low	43	43.0
Zero	8	8.0
Total	100	100.0

Table 2 - Nursing staff distribution according to risk factors for diabetes mellitus – 10/2003 to 03/2004

Risk factors	n	%
Sedentary lifestyle	81	81.0
BMI ≥ 25 Kg/m²	55	55.0
Age ≥ 45	41	41.0
Family history of diabetes (1st and 2nd degree kinship simultaneously)	20	20.0
Family history of diabetes (2nd degree kinship)	20	20.0
Family history of diabetes (1st degree kinship)	36	36.0
Abdominal circumference ↑	35	35.0
Hypertension	24	24.0
(*) Macrosomia	6	6.8
(*) Gestational diabetes	1	1.1

(*) The total number of female workers was 88.

Throughout the data analysis, it was observed that the risk factors considered reversible were strongly present in the group. These findings are important, since such occurrences, modifiable events, are commonly associated in the literature with a deficit in self-care.

Participants were also asked about the quantity of employment contracts, adherence to self-care activities such as maintaining a balanced diet (daily consumption of fiber, vegetables and greens, restriction of polyunsaturated fat to a maximum frequency of one to three times in week) and the practice of regular physical activity (completion of 30 minutes of physical activity daily or at least three times a week), and their perception of the level of stress experienced in everyday life.

Table 3 - Distribution of nursing staff according to number of employment contracts, difficulty in maintaining a balanced diet, and perceived level of stress attributed to the pace of life - 10/2003 to 03/2004

Variable	n	%
Number of contracts		
1	41	41.0
2	48	48.0
3	10	10.0
4	1	1.0
Admitted difficulty in maintaining a balanced diet	26	26.0
Admitted frequent stress attributed to the pace of daily life.	49	49.0

Regarding the number of employment contracts, 59% reported having two or more contracts. These data reflect the reality of many nursing professionals who have to rely on multiple work shifts due to low salaries[2], which significantly decreases the available free time (Table 3).

When asked about the quality of their diet, 26% of participants referred to the difficulty in maintaining a balanced diet. When asked about the perceived level of stress experienced in everyday life, the number of respondents who admitted frequently experiencing a level of stress was 49% (Table 3).

Table 4 - Distribution of 26 nursing staff according to motivation for not adopting a balanced diet - 10/2003 to 3/2004

Motivation cited	n	%
Motive 1 – I don't eat better because I think it does not cause me problems	3	4.3
Motive 2 – I don't have enough time to prepare it properly	34	49.3
Motive 3 – I don't like fruit or vegetables	5	7.2
Motive 4 – I am simply not motivated	12	17.4
Motive 5 – Nobody in my house likes fruit	2	2.9
Motive 6 – Other motives	13	18.9
Total	69*	100.0

* the 26 participants indicated more than one answer

Table 5 - Distribution of 81 nursing staff according to motivation for not adhering to the practice of physical exercise - 10/2003 to 3/2004

Motive referred	n	%
Lack of time	43	47.7
Lack of motivation	27	30.0
Don't like	9	10.0
Don't have a place nearby	11	12.3
Total	90*	100.0

* the 81 participants indicated more than one answer

The 26 participants who admitted difficulty in maintaining a diet that could be considered balanced were asked to indicate which of the five motives presented best explained the difficulty of greater adhesion. The motive most cited was "I do not have enough time to prepare it properly", which was indicated 34 times (49.3%) (Table 4).

When asked about the reason for the lower adherence to the practice of physical activity, the 81 participants considered sedentary, had the option to indicate more than one answer. Ninety indications were obtained. The factor "lack of time" was the most cited with 47.7% of the indications, followed by "lack of motivation" with 30% (Table 5).

DISCUSSION

The study made evident the occurrence of major risk factors of a reversible nature, which, over time,

expose workers to risk conditions highly favorable for the development of NCCD, including type 2 diabetes mellitus. This is a paradoxical situation, since there is an expectation that health workers, at least in theory, should fully exercise the actions of self-care. Quotidian life, however, reveals that complex situations related to the world of work, represented, among others, by low remuneration which implies the need for multiple employment contracts, long hours often marked by stressful routines at an accelerated pace, along with many hours standing, etc., promote a slow and continuous attrition, which directly affects the quality of attention given to self-care[2-3]. These factors contribute to chronic fatigue which favors, in the process of self-care, options that lead to a practicality that requires less effort, whether in diet, leisure, physical activity, or in various aspects of quotidian life[1], often consisting of less healthy alternatives.

The literature[2,11-14] has confirmed how much the excessive workload and elevated stress levels impact on the quality of life and health of nursing staff. Findings were identified in this study that manifested in direct relation to the excessive workload. This understanding leads to the consideration of the importance of planning actions of health promotion in the workplace itself which consider, in addition to guidance and support for adjustments to lifestyle, stress management actions.

CONCLUSIONS

From the results obtained, it may be considered that any actions that are organized to this effect must be perpetuated throughout the life of these workers. It is believed that only continuous actions can positively affect the prevention or reduction of the appearance of risk conditions favorable to the development of chronic diseases compromising both the quality of life and the quality of care provided.

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