ABSTRACT

Objective: to assess the knowledge on risk factors for metabolic syndrome before and after educational intervention in university students. Method: quasi-experimental, comparative study, accomplished with 66 students of a public University. We used a semi-structured form for socioeconomic, anthropometric data, physical activity practice, and a questionnaire to measure the knowledge grade before and after educational interventions. Educational group intervention included three meetings lasting two hours each. The post-test was applied immediately, and after 60-day interventions. The project was approved by the Ethics and Research Committee, CAAE 0408.0.045.000-11. Results: the participants were 23.1-year old (± 3.24), 59.1% being women. The knowledge level “Very good knowledge” went from 15.1% to 33.4% after the interventions. When assessed, the students kept their knowledge level. Conclusion: the group educational intervention promoted an increase of knowledge concerning the risk factors associated with the metabolic syndrome.

Descriptors: Education in health; Syndrome x Metabolic; Students.

RESUMO


RESUMEN

Objetivo: evaluar el conocimiento sobre los factores de riesgo para la síndrome metabólica antes y después de las intervenciones educativas, en estudiantes universitarios. Método: estudio casi experimental, comparativo, realizado con 66 estudiantes de una universidad pública. Se utilizó un formulario semiestructurado para los datos socioeconómicos, antropométricos, la práctica de actividad física, y un listado de preguntas para medir el nivel de conocimiento antes y después de las intervenciones educativas. La intervención educativa grupal se realizó en tres encuentros de dos horas cada uno. La prueba posterior se llevó a cabo de inmediato, y luego de 60 días de las intervenciones. El proyecto fue aprobado por el Comité de Ética en Pesquisa (Comité de Ética en Investigación, en español), CAAE 0408.0.045.000-11. Resultados: los participantes tenían un promedio de 23 años, siendo que 59,1% eran mujeres. El nivel de conocimiento “Muy buen conocimiento” pasó de 15,1% a 33,4% luego de las intervenciones. Cuando los estudiantes fueron evaluados posteriormente mantuvieron el nivel de conocimiento. Conclusión: la intervención educativa grupal promovió el aumento de conocimiento sobre los factores de riesgo vinculado al síndrome metabólico. Descriptores: Educación Sanitaria; Síndrome x Metabólico; Estudiantes.
INTRODUCTION

As a consequence of the change in the population morbidity and mortality profile, there is a growing increase in the incidence of non-communicable chronic diseases, enrolled, especially, to those involved in adopting unhealthy life practices, such as sedentary lifestyle.

In this context, it is possible to perceive that the impact of chronic diseases on the society, especially cardiovascular diseases is growing. Especially when there is an evolution for varying degrees of incapacity or death.\(^\text{1,2}\)

Given these circumstances, the Metabolic Syndrome (MS) has received a special focus because it is a complex disorder, and can be defined as a constellation of cardiovascular risk factors that increase the likelihood for developing atherosclerotic diseases and type-2 diabetes.\(^\text{3}\)

MS components may be listed as follows:

- High Blood Pressure (BP), byslipidemia, hyperglycemia, and abdominal obesity.\(^\text{4}\)
- Although the risk factors, alone, have specific impact on health, very frequently they are aggregated to the individuals.\(^\text{5}\)

Studies performed in different populations in the world, such as Mexican, Asian and American, express important high-prevalence data for MS, so that, depending on the criteria used and the characteristics of the reviewed population, the prevalence ranged from rates of 12.4% to 28.5% in men and from 10.7% to 40.5% in women.\(^\text{6}\)

In a meta-analysis that included 12 cross-sectional studies, performed in Latin American countries, it was showed that the general prevalence (weighted mean) of MS, in accordance with the criteria of the National Cholesterol Education Program Adult Treatment Panel (NCEP ATP) III, was 24.9%.\(^\text{7}\)

Given the aforementioned, preventive measures should be implemented in order to minimize the appearance of risk factors related to the syndrome and to reduce the possibilities for pathological phenomena manifestations, where health maintenance and development require systematic actions aimed at the most varied aspects and complexity of life. This result requires that society, especially health services, make possible educational approaches, both on the individual and collective level, which may come to promote health.\(^\text{8}\)

Such measures should extrapolate the healthcare environment in order to favor a larger portion of the population. Thus, this study aims to:

- Assess the knowledge of university students, with risk factors for MS, about this pathology, before and after health education intervention.

METHOD

Quasi-experimental, comparative study, held from October 2013 to July 2014. Students of both genders, aged from 18-years, regularly enrolled in a Higher Education Institution (HEI), from the city of Picos-PI. The subjects were selected, using a database query, built-up from the research on the risk factors for MS, in students of a public university of Picos-PI.\(^\text{9}\)

The settled inclusion criteria were: having two or more risk factors for MS; being enrolled and attending regularly a HEI; participating in all research stages, including interviewing, waist circumference measurement, measuring blood pressure (BP), Body Mass Index (BMI), biochemical, chemical dosages of triglycerides, HDL-cholesterol, blood sugar level; and participating in all of health education meetings.

The sample consisted of 66 university students from different courses of HEI, divided into three groups. The allocation of university students in groups, with 22 people each, took place at random. A form was used to record socio-demographic variables (gender, age, class, graduation period, family income, economical class) and medical clinics (BMI, Waist Circumference - WC, BP, physical activity, blood sugar level, triglycerides, HDL-c), and questionnaires to assess the level of knowledge before and after any educational intervention.

In relation to physical activity practice, we considered sedentary the student not practicing, at least, 30 minutes a day, for at least five times a week, performing light or moderate activities; or 20 minutes a day of vigorous activities, in three or more days a week.\(^\text{10}\)

For accessing WC, BP, blood-sugar in fasting, HDL cholesterol and triglycerides, we followed the recommendations of NCEP ATP III.\(^\text{11}\)

Knowledge level before and after the interventions was ranked in six categories.\(^\text{12}\)

However, to allocate the results obtained in the categories, we assigned grade-ranges from zero to 10, as follows: no knowledge (zero), very little (<1-2.9), little (3-4.9), good (5-6.9), better than good (7-8.9), very good (9-10).

Educational interventions were carried out in the HEI, organized in three phases: 1 - evaluating knowledge level on MS, the risk factors and prevention forms, with the application of a pre-test. 2 - commencement of educational interventions; 3 - completing educational interventions and assessing.
knowledge level on MS, risk factors and prevention forms, with the application of a post-test in two separate occasions: immediately after the intervention (immediate post-test) and after 60 days (late post-test).

The interventions took place with a group composed of 22 people, weekly, with an interval, of at least, five days. In the educational interventions, we applied a health-education strategy, which focused on participatory education, the influence of pre-existing beliefs, opinions, and knowledge necessary for the learning process, as well as the interaction among researchers/university students and university student/university students.

As the goal was to evaluate the effectiveness of educational intervention, data analysis involved comparing the results on the level of knowledge before and after interventions. To compare the proportion of knowledge level before and after the educational interventions, we used Kendal's correlation coefficient. Comparing the means of the grades obtained was done through Friedman's test. The inferential analyses with p<0.05 value were considered statistically significant.

The project was approved by the Ethics and Research Committee in Human Beings from the Federal University of Piauí, by the Certificate of Introduction to the Ethical Assessment of No. 0408.0.045.000-11. All subjects signed the Free and Clarified Consent Form (FCCF).

### RESULTS

In this study, 66 students were included of both genders, being 59.1% women, with mean age: 23.14 ± 4.3 years. With relation to marital status, 90.9% were single, and 40.9% lived with friends; on the economical class, 86.4% were in C or D classes.

The values of anthropometric, life style and biochemical variables for university students obtained during the investigation period are submitted in Table 1. Among the modifiable risk factors for MS, we may highlight overweight, found in 40.9% of the sample, high triglycerides (42.4%) and low HDL-c (75.8%). As for the practice of physical activity, the majority (63.6%) referred not practicing it.

#### Table 1. Distribution of the sample according to modifiable risk factors for MS. Picos-PI, 2014.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BMI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>39</td>
<td>59.1</td>
</tr>
<tr>
<td>Overweight</td>
<td>27</td>
<td>40.9</td>
</tr>
<tr>
<td>2. WC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>60</td>
<td>90.9</td>
</tr>
<tr>
<td>High</td>
<td>6</td>
<td>9.1</td>
</tr>
<tr>
<td>3. BP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>33</td>
<td>50.0</td>
</tr>
<tr>
<td>Normal</td>
<td>28</td>
<td>42.4</td>
</tr>
<tr>
<td>High</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td>4. Physical activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>24</td>
<td>36.4</td>
</tr>
<tr>
<td>Sedentary</td>
<td>42</td>
<td>63.6</td>
</tr>
<tr>
<td>5. Blood-sugar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>66</td>
<td>100</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Triglycerides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>38</td>
<td>57.6</td>
</tr>
<tr>
<td>High</td>
<td>28</td>
<td>42.4</td>
</tr>
<tr>
<td>7. HDL-c</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>16</td>
<td>24.2</td>
</tr>
<tr>
<td>Low</td>
<td>50</td>
<td>75.8</td>
</tr>
</tbody>
</table>

With relation to knowledge level, before educational intervention in-group, 57.6% and 15.1% of university students had "More than good knowledge" and "Much with knowledge", respectively. After the interventions, the level of "Very good knowledge" increased from 15.1% to 33.4% and 45.5% after 60 days (p<0.0001). And the mean of the grades obtained immediately and 60 days after the end of the interventions showed values higher than the evaluation mean prior to the commencement of interventions (p=0.0025) (Table 2).
The prevalence of overweight found in this study is considered high when compared with other investigations carried out with university students ranging from 18.2% to 24.8%. Such information is considered worrying. Since obesity is a major risk factor for developing chronic diseases, such as MS.

As observed, a low percentage of university students had altered values of WC and BP. On the other hand, most individuals were ranked as sedentary. Higher values have been identified in a research carried out with 234 university students from Campina Grande - PB, which revealed that 15.8% of the students had high BP values and 43.6% had overweight and obesity. However, similarly, 52.6% of university students showed insufficient levels of physical activity.

With relation to biochemical parameters for MS, considerable share of students showed altered values for triglycerides and HDL-cholesterol. The data found in this study are considered high when compared with a survey conducted with university students, where only 21.95% had diminished HDL-c and 14.63% hypertriglyceridemia.

As for the interventions, the students acquired increased knowledge level after the educational sections, with regard to risk factors related to MS and prevention of the main morbidities occasioned by it. Corroborating with such data, a study performed with adolescents for preventing DM2, it was found that before the educational group intervention (five meetings of two hours each), 57.8% of students had “Good knowledge” and, after the interventions, 64.4% acquired “More than good knowledge”.

Educational intervention has represented an efficient strategy in preventing and treating chronic diseases, such as DM2, hypertension and MS, so that such interventions, and being successful, could also fall within metabolic-parameter changes. In this perspective, a survey with 261 adults with hypertension, found that after educational interventions through regular meetings with of 60-minute duration, there was a significant reduction in BP measures. Given such data, health education seems to represent a viable tool for encouraging changes related to negative health conducts.

The educational program contributes, inter alia, for reducing postprandial blood-sugar levels, for preventing the development of DM and cardiovascular diseases. When affirming that obesity, sedentary lifestyle, smoking, and systemic arterial hypertension are modifiable risk factors, the study demonstrates the need for promoting programs that encourage the adoption of healthy habits within the academic environment itself, since such students are powerful multipliers for the entire population.

Higher education is indispensable in developing and implementing preventive plans and actions in order to promote to students the opportunity to influence the community where they act. In these locations, inserting health education as a curricular content is essential in promoting a healthy university, aiming to preventing and early detection of diseases, transcending the mere transmission of information, based on the sociocultural context of academics, their values, beliefs and knowledge.

Even when observing the knowledge acquisition by the group of university students, it is possible to notice that they already had a good prior knowledge. This situation is relevant when thinking that, because they are mostly healthcare area students, they have the knowledge on the importance regarding the regular practice of physical activity, and healthy eating, on quality of life and promoting health.

At the same time, controversial, where states of overweight and obesity are frequent in this population. Furthermore, only obtaining knowledge does not warrant the modification of risk behavior for the
development of diseases, there are also involved essential conditions that do not depend on the assumption of the people, where social, cultural and economic factors are emphasized.

CONCLUSION

Educational group interventions promoted increased knowledge on the risk factors associated with MS. Such being the case, implementing educational practices should be increasingly encouraged in universities, as this period is important for developing health-related conducts that can be maintained for life. However, just knowing the problem is not enough for not seeming to have a protective effect on the adoption of a healthy lifestyle and, being enrolled in health-related areas, does not seem to positively impact students’ behaviors.

A difficulty observed in this study was related to adherence of university students regarding attendance at educational interventions. Some reasons might be listed, such as lack of time to take part in the meetings and the idea of prior knowledge about the information dispensed at the intervention time.

Moreover, the scarcity of scientific literature on educational interventions for university students about MS was a limitation for further discussion of this research. However, the scarcity of studies reveals the need for developing a more specific investigation with this population; and searching evidences that may allow for direct adoption of everyday habits that might prevent or delay the onset of MS.

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Moura JRA, Vieira EES, Sousa BMS et al.

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Corresponding Address
Ana Roberta Vilarouca da Silva
Rua Cícero Eduardo, 905
Bairro Junco
CEP 64600-000 – Picos (PI), Brazil