

Physical education teachers' knowledge about chronic diseases risk factors in a Southern Brazilian city

Conhecimento de professores de educação física sobre fatores de risco para doenças crônicas de uma cidade do sul do Brasil

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Abstract – The improvement in population quality of life may be associated to the increase in the awareness about chronic diseases risk factors. The aim of the present study was to evaluate physical education teachers' knowledge about the associations between four behavioral factors (sedentary lifestyle, smoking, abusive alcohol intake, and inadequate eating) and eight diseases (diabetes, hypertension, AIDS, osteoporosis, lung cancer, depression, liver cirrhosis and acute myocardial infarction). A census-based cross-sectional study was carried out including 188 teachers (men and women) from public and private schools from Pelotas/RS. For each behavioral factor, a knowledge score was generated, ranging from zero to eight points. The highest score was observed for sedentary lifestyle (6.4), followed by inadequate eating (5.9), smoking (5.3), and abusive alcohol intake (4.5). Overall, higher knowledge scores were observed among teachers from lower age groups, and workplace and working hours were also associated to the outcome. Governmental strategies in health and education are needed to improve teacher's knowledge enabling professionals to perform their jobs satisfactory.

Key words: Chronic diseases; Knowledge; Risk factors; Teachers.

Resumo – A melhora da qualidade de vida de uma população pode estar relacionada com o aumento do conhecimento sobre os fatores de risco que conduzem a doenças crônicas. Desta forma o objetivo do presente estudo foi avaliar o conhecimento dos professores de Educação Física sobre as associações entre quatro fatores comportamentais (sedentarismo, tabagismo, consumo excessivo de álcool e alimentação inadequada) e oito morbidades (diabetes, hipertensão arterial, AIDS, osteoporose, câncer de pulmão, depressão, cirrose hepática e infarto agudo do miocárdio). Foi realizado um estudo observacional, de caráter transversal e cunho censitário, incluindo 188 professores de ambos os sexos, das redes de ensino básico pública e privada da cidade de Pelotas/RS. Para cada fator comportamental, foi gerado um escore de conhecimento, que variava de zero a oito pontos. A maior média deste escore ocorreu para o conhecimento sobre sedentarismo (6,4), seguido por alimentação inadequada (5,9), tabagismo (5,3) e consumo excessivo de álcool (4,5). Podemos concluir que os maiores escores de conhecimento estiveram relacionados com faixas etárias mais baixas, com o local e a jornada de trabalho. Políticas públicas voltadas à saúde e educação são indispensáveis e urgentes para requalificar os docentes e prepará-los para a tarefa de ensinar.

Palavras-chave: Conhecimento; Docente; Doenças crônicas; Fatores de risco.

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INTRODUCTION

Adolescents and young adults constitute a growing risk group for both chronic diseases¹ and for sexually transmitted infections, including infection by HIV². For that reason, programs for prevention in adolescence should be developed in schools, and the Brazilian Ministry of Health proposes prevention programs in the school as one of the components of a broad program to reduce the prevalence of these risk factors³.

Prevention programs include the need for increasing awareness of students regarding how to adopt and sustain healthy lifestyles, because knowledge regarding health is a factor that may contribute to behavioral change in a population as the greater the knowledge, the greater the chances of adopting habits that may be favorable to the quality of life of a determined population group⁴. It is worth highlighting, however, that knowledge in itself is fundamental for quality of life, but it is not enough result in behavioral changes. Nevertheless, it is a primordial factor in assisting the possibility for change^{2,5}.

This knowledge should be passed on by all professional working in the health field^{6,7} and, in the school environment, by teachers connected with the area, among whom are physical education teachers. However, there is evidence that part of the teachers do not develop themes related to health promotion, giving priority to the traditional content of school physical education, especially sports like soccer, volleyball, basketball and handball^{8,9}. When knowledge related to disease prevention is not adequately dealt with in the school environment, students tend to seek this type of knowledge outside of the school – from other professionals in the health area, from family members or on television¹⁰ where what is broadcast is not always correct¹¹.

There are not many studies that deal with people's knowledge regarding non-transmittable diseases and disorders^{4,10,12,13}. This same lack of information is seen in relation to teachers' knowledge regarding chronic diseases, notably in regard to prevention of disorder, such that the studies found are limited to considering a specific disorder or behavioral risk factor⁵, which do not allow general conclusions to be drawn regarding the effectiveness of this approach in schools.

Thus, the purpose of the present study was to assess knowledge regarding associations between four behavioral factors (sedentary lifestyle, smoking, excessive alcohol consumption and poor eating habits) and eight diseases (diabetes, hypertension, AIDS, osteoporosis, lung cancer, depression, cirrhosis and acute myocardial infarction), as well as verifying the association of this knowledge with socio-demographic variables in physical education professionals in a Southern Brazil city.

METHODOLOGICAL PROCEDURES

A census-based cross-sectional study was undertaken. All 112 primary schools of the urban area of the city of Pelotas, RS, eligible for the study

were contacted. Authorization was requested from the Municipal Education Office, responsible for the municipal public schools, and the 5th Regional Educational Coordination Office, charged with the state and private schools, duly protocolled to carry out research on the teaching institutions. Together with the request for authorization for carrying out the research, a report of all existing schools in operation in the urban zone of the city was requested, a document which served as a basis for guiding data collection.

To measure the degree of knowledge, the instrument proposed by Borges et al.¹² was used. The instrument used assesses knowledge of the population regarding the influence of four risk factors (sedentary lifestyle, smoking, excessive alcohol consumption and poor eating habits) on non-transmissible diseases and disorders and eight diseases (diabetes, hypertension, AIDS, osteoporosis, lung cancer, depression, cirrhosis and acute myocardial infarction). Definition of right or wrong for each response was based on review papers about the association of each risk factor and disease or disorder, with a preference for systematic reviews and meta-analyses¹². For each one of the four factors, a score of correct responses was determined, which could range from zero to eight points.

Demographic, socioeconomic, health, nutritional and teaching characteristics were assessed by means of a standardized questionnaire, containing sixty questions. Age was registered in full years and categorized in decades. The socioeconomic level was categorized according to classification from the Brazilian Research Company Association (Associação Brasileira de Empresas de Pesquisa)¹⁴ and nutritional state was determined by the body mass index (BMI), calculated from self-reported weight and height and categorized according to WHO criteria¹⁵.

The instrument used to assess the level of physical activity was the *International Physical Activity Questionnaire* (IPAQ)¹⁶, long version, composed of questions that deal with the domains of leisure, commuting, domestic activities and occupation. For the present study, only leisure domain in a usual week was considered to the extent that the level of physical activity reported in the work and domestic environments appears to be overestimated¹⁷, and the leisure domain seems to be the most remembered¹⁸. The score was calculated in the following manner: minutes per week of walking + minutes per week of moderate physical activity + (minutes per week of vigorous physical activity * 2)¹⁹. Teachers that reached 150 minutes of physical activity per week were considered to be active and those who remained below that value were considered to be insufficiently active.

The questionnaires were self-administered with 98.9% being filled out in the school environment. As an exception, the place of collection was different, place of work (fitness centers) or at the professional's home. Eligible teachers were considered to be all those who were exercising a teaching function in the data collection period; professionals who were working exclusively in administrative functions, in departure from their function or under leave of any nature were excluded. Information on the number of physical education teachers who worked in the school was provided by

the principal or pedagogical coordinator and, in the event of doubt, the time sheet was checked. Teachers who verbally expressed the desire not to participate in the study on two different occasions, with a minimal interval of one week, were considered as refusals. The period of collection was from June to December, 2009.

Nine students originating from the nutrition and physical education courses of the Universidade Federal de Pelotas acted as interviewers in the study. The students passed through 12 hours of training. These research assistants helped in understanding of the questionnaire and assisted in the event of questions regarding how to fill it out. Ten percent of the research subjects were drawn at random for quality control which occurred through telephone contacts with teachers and by visits to school institutions and was carried out by the supervisors of the field work, using a reduced questionnaire containing key questions selected from the instrument. There was no discrepancy between the responses given to the interviewers and those provided to the supervisors of the field work during quality control.

All the participants signed the informed consent form and the study was approved by the Ethics Committee of the School of Physical Education (Escola Superior de Educação Física) of the Universidade Federal de Pelotas (ESEF/UFPel) with protocol number 032/2009.

The database was built on Epi-Info 6.0, with each questionnaire being typed in twice so as to check for typing mistakes. For data analysis, the Stata program was used, version 10.0. Data analysis included a description of the sample, stratified by gender, with calculation of proportions for each subgroup of exposure. A descriptive analysis of the correct responses for each risk factor related to the Non-Transmissible Diseases and Disorders (NTDDs) was carried out. Then the Spearman correlation was calculated between the knowledge scores for each one of the four risk factors for NTDDs collected (sedentary lifestyle, smoking, excessive alcohol consumption and poor eating habits). Finally, the means of the scores between the subgroups of the independent variables were compared. Significance was assessed by Student t test, Mann-Whitney U-test, one-way analysis of variance and Kruskal-Wallis test, according to the number of groups being compared and attending the suppositions of each test. The level of significance was set to $p < 0.05$.

RESULTS

The sample included 188 physical education teachers from primary schools from the urban area of the city of Pelotas, RS. The percentage of loss was 10.3% and percentage of refusals was 1%, for a total of 11.3%. According to table 1, most of those interviewed (61.3%) were female and the general average age was 40 years old with standard deviation of 9. Most of the teachers, 2/3 of the sample, were in economic class B (upper middle class). As no teacher was in economic classes D and E (lower classes), they were removed from the tables.

Approximately 80.0% of the teachers had never smoked, 39.1% were overweight or obese and 44.0% of the sample was classified as insufficiently active in leisure time.

The large majority of teachers had completed a college/university degree within the last 10 years (65.0%) and more than half of those interviewed (55.4%) had graduate studies. Approximately 1/3 works outside the school and nearly 25.0% have a working week greater than or equal to 41 hours. In addition, approximately 12.0% exercise their function in schools of the public and private school networks at the same time.

Table 1. Description of Physical Education professionals according to sociodemographic, nutritional, behavioral and work variables. Pelotas, RS, 2009.

Variables	Total	
	N	%
Sex		
Male	72	38.7
Female	114	61.3
Age (years)		
20-30	33	17.5
31-40	58	30.9
41-50	74	39.4
≥51	23	12.2
Socioeconomic level		
A	59	31.4
B	124	66.0
C	5	2.6
Smoking		
Smoker	16	8.6
Ex-smoker	24	12.9
Never smoked	146	78.5
BMI (Kg/m ²)		
Eutrophic	112	60.9
Overweight	58	31.5
Obese	14	7.6
Graduate studies		
Yes	103	55.4
No	83	44.6
Time since graduation (years)		
Up to 10	119	65.0
> 10	64	35.0
Work performed outside of the school		
Yes	57	30.3
No	131	69.7
Work hours per week		
Up to 40	131	75.7
≥41	42	24.3
Active in which teaching system		
Public	145	78.0
Private	19	10.2
Public and private	22	11.8
Level of physical activity in leisure time		
Insufficiently active	81	43.6
Active	105	56.4

In Table 2 are presented the percentages of “correct” responses for the associations between risk factors and diseases in physical education teachers in the city of Pelotas, RS, Brazil. When the risk factors for NTDDs were verified, the greatest percentage of correct responses occurred in association of sedentary lifestyle and the types of diseases that were being studied. Of those interviewed, 5.6% got all the associations right, and the greatest and least percentage of correct answers in relation to sedentary lifestyle were between this factor and Acute Myocardial Infarction AMI and lung cancer with 94.4% and 14.7% respectively.

The lowest proportion of right answers was observed between excessive alcohol consumption and the types of diseases assessed in the study, but, nevertheless, the causal relationship between abusive alcohol consumption and cirrhosis, in addition to being very consistent in the literature, appears to be well-known by the population studied since nearly all of those interviewed (98.3%) identified this relationship. High percentages of right answers were also found in the relationships between abusive alcohol consumption and depression, as well as with hypertension (86.2% and 83.7% respectively). The lowest prevalence of correct responses for this risk factor was its relationship to AIDS (2.4%) and lung cancer (9.4%).

High prevalence of correct responses was found between smoking and its relation to lung cancer, with this being the most prevalent of the correct responses, and AMI (98.9% and 96.6% respectively). For this risk factor, the lowest prevalence of correct answers was for diabetes (9.5%). In relation to eating habits, for its part, the population studied seems to be well aware that this is a risk factor for the development of diabetes (96.6%), hypertension (93.7%) and osteoporosis (93.7%). However, one statistic that raises concern is the lack of knowledge of the relationship between eating habits and lung cancer since only 14.7% of the people was correct in making this association.

Table 2. Description of percentage of “correct” responses for associations between risk factors and diseases in physical education teachers in the city of Pelotas, RS.

Diseases	Risk factors			
	Sedentary Lifestyle	Smoking	Excessive alcohol consumption	Poor eating habits
	Correct responses (%)			
Diabetes	84.5	9.5	62.3	96.6
Hypertension	93.8	85.6	83.7	93.7
AIDS	93.2	94.1	2.4	92.4
Osteoporosis	90.8	34.3	33.7	93.7
Lung cancer	14.7	98.9	9.4	14.7
Depression	85.3	41.8	86.2	60.6
Cirrhosis	81.7	66.1	98.3	42.7
AMI	94.4	96.6	79.2	92.5
% of 8 correct answers	5.6	0.7	0.6	1.2

AMI=Acute Myocardial Infarction

Analysis of the correlation between the knowledge scores was performed, and the greatest correlation observed ($r=0.33$) occurred between knowledge regarding a sedentary lifestyle and poor eating habits. All the other correlation coefficients ranged from 0.25 and 0.28, except for the relationship between knowledge regarding smoking and excessive alcohol consumption ($r=0.06$).

Table 3 presents the mean score of knowledge for each one of the risk factors according to independent variables. Teachers 51 years old or older proved to have less knowledge regarding smoking in comparison with the other age groups; however, this cannot be seen in the other risk factors. Moreover, regarding tobacco, those teachers that work in the school and in another location proved to have greater knowledge regarding this variable when compared to their colleagues that work only in the school. In relation to eating habits, those with a work week of up to 40 hours a week showed a significantly greater knowledge in respect to eating habits in comparison with those that have a longer work week.

Table 3. Mean scores of knowledge of risk factors according to sociodemographic variables. Pelotas, RS, 2009.

Variables	Sedentary Lifestyle	Smoking	Excessive alcohol consumption	Poor eating habits
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Sex [#]	P=0.2	P=0.4	P=0.3	P=0.07*
Male	6.5 (0.9)	5.4 (1.0)	4.7 (1.4)	6.0 (0.8)
Female	6.3 (1.1)	5.2 (1.0)	4.6 (1.4)	5.7 (1.1)
Age ^{##}	P=0.4	P=0.04	P=0.3	P=0.3
20-30	6.5 (0.9)	5.3 (1.5) ^b	4.9 (1.3)	6.0 (0.8)
31-40	6.5 (1.0)	5.2 (1.1) ^b	4.7 (1.3)	6.0 (1.1)
41-50	6.3 (1.0)	5.3 (1.0) ^b	4.3 (1.4)	5.7 (1.1)
≥ 51	6.0 (1.5)	4.7 (1.1) ^a	4.5 (1.5)	5.6 (1.1)
Socioeconomic level ^{##}	P=0.1*	P=0.3	P=0.2	P=0.5
A (richer)	6.2 (1.1)	5.2 (0.9)	4.4 (1.4)	5.8 (1.1)
B/C	6.4 (1.0)	5.4 (1.1)	4.6 (1.3)	5.9 (1.0)
Graduate studies [#]	P=0.9	P=0.9	P=0.2	P=0.6
Yes	6.4 (1.1)	5.3 (1.0)	4.5 (1.4)	5.8 (1.1)
No	6.4 (1.0)	5.3 (1.0)	4.7 (1.4)	5.9 (1.0)
Time since graduation (years) [#]	P=0.09	P=0.2	P=0.2	P=0.08
Up to 10	6.3 (1.1)	5.2 (1.0)	4.4 (1.4)	5.7 (1.1)
> 10	6.5 (1.0)	5.4 (1.1)	4.7 (1.3)	6.0 (0.9)
Work performed outside of the school [#]	P=0.2	P=0.006	P=0.2	P=0.6
Yes	6.5 (1.0)	5.6 (0.9)	4.7 (1.4)	5.9 (1.0)
No	6.3 (1.1)	5.1 (1.0)	4.5 (1.3)	5.8 (1.0)
Work hours per week [#]	P=0.3*	P=0.3	P=0.8	P=0.01*
Up to 40	6.4 (1.0)	5.4 (1.1)	4.5 (1.4)	5.9 (1.1)
≥41	6.1 (1.3)	5.2 (1.0)	4.6 (1.2)	5.6 (0.8)

t-Test; ## Analysis of variance; * Mann-Whitney test; ** Kruskal-Wallis test; ^a statistically significant difference from the other age groups.

DISCUSSION

An aspect to be highlighted in this study is its census based nature and the low loss and refusal rate (11.3%). On the other hand, it is necessary to clarify that there is no gold standard for the measurement of people's knowledge regarding risk factors for non-transmissible diseases and disorders. That way, we have decided to use a standardized instrument with identical questions for the four risk factors, allowing comparative analyses. For each one of the factors, there is a varied number of correct positive responses, ranging from five (smoking) to eight (abusive alcohol consumption).

The present study showed a high percentage of correct responses in the associations most disclosed in literature and the media. We had more than 90% correct responses for the positive or negative associations between sedentary lifestyle and hypertension, AIDS, osteoporosis and AMI; smoking and its relationship to AIDS, lung cancer and AMI; excessive alcohol consumption as a causal factor of cirrhosis, and eating habits related to diabetes, hypertension, AIDS, osteoporosis and AMI.

A methodological challenge found in the present study is the definition of the associations as "right" or "wrong". Based on the study of Borges et al.¹², we chose to maintain the same definitions used by the authors (right or wrong), since these associations were based on the scientific literature. Nevertheless, they may not be defined as absolute scientific truths, keeping in mind that some of these associations are well established in the literature as causes or not of the disease studied and others are still being discussed, without consensus on the matter. The choice for this instrument occurs from the lack of a gold standard for assessment of knowledge in population studies. Another point we have taken into consideration for the choice of the instrument was its use in another population study, which showed good understanding on the part of those interviewed regardless of the level of formal education.

As a standardized questionnaire, the questions were asked in an identical manner, changing only the risk factor (sedentary lifestyle, smoking, alcohol and eating habits), thus permitting comparison of the results. For each one of the risk factors, the number of "yes" answers ranged from five (smoking) to eight (alcohol).

There are not many studies found in the scientific literature that verify people's knowledge regarding risk factors and disease; however, those that exist deal with knowledge of a determined disease in populations already attacked by the disease²⁰⁻²¹. In our case, the sole criterion for being part of the sample was to be a physical education teacher; and if they had some of the diseases studied, it was by chance, since we did not look for those that had such diseases.

The lack of knowledge of some associations deserves greater attention, as for example, the association of a sedentary lifestyle with diabetes and depression. Although the prevalence of correct responses is high, approximately 85% for both diseases, the rate of correct answers expected was greater since we are dealing with physical education teachers and

also from the fact that this type of association is already very consistent in the scientific literature. Similar responses in the relationship between sedentary lifestyle and diabetes were found in the study of Knuth et al.¹³, in which 86.0% of students of the four years of a higher education course in Physical Education correctly identified this association.

Another piece of information that merits attention in the present study was the low knowledge regarding sedentary lifestyle and lung cancer presented by the sample studied (14.7%), in spite of the existence of studies showing the protective effect of physical activity over this type of cancer, which is one of the most prevalent in the population²². Nevertheless, similar results were found by Borges et al.¹², in a population based study in which they observed that only 16.7% of the sample studied reported knowledge in respect to this association.

Knowledge of the teachers studied in respect to the association between abusive alcohol consumption and poor eating habits with lung cancer was also low (9.4% and 14.7% respectively), values lower than those found in a population study performed in the south of Rio Grande do Sul in which approximately 31.0% of those interviewed responded correctly regarding the existence of the association between abusive alcohol consumption and lung cancer and 24.0% regarding the association of this disease with poor eating habits⁵. Although the knowledge is low in the two samples studied, the teachers proved to have less knowledge than the population in general in regard to such conclusion; nevertheless, this lack of knowledge may be related to broad disclosure of smoking as the main cause of lung cancer, with the other risk factors often without disclosure, which may lead to a general lack of knowledge in their respect¹².

In relation to teachers' knowledge regarding abusive alcohol consumption and its association with AIDS, the results indicated correct responses of less than 5.0%. This low percentage of right answers may be explained as a result of this association not yet being well disclosed in the literature and alcohol consumption not being a direct cause of this disease. Nevertheless, abusive consumption of alcoholic beverages may lead people to behavioral change, leading to negligence and weakness, which may favor contact with contaminated persons, leading to spread of the disease.

Physical education teachers were also found to have little knowledge regarding the association between the habit of smoking and diabetes, where less than 10.0% of those interviewed knew of the existence of this association. In the study of Borges et al.¹², knowledge of this association did not reach one third of the sample studied which, in spite of being low, was significantly higher than the score presented in this study. In this respect, it stands out that physical education teachers exhibit such low knowledge scores for this association, in spite of 2/3 of them having recent educational training – within the last 10 years, more than half have graduate studies and the dimension that campaigns and programs in the media have assumed in recent years, as recent studies indicate^{10,23}, factors that should contribute to improve knowledge of this association.

Another factor we consider to be important and which is related to the need for greater information is the direct influence that the physical education teacher can exercise on the population in general. According to Mendes et al.¹⁰, in a population-based study, when the importance of the engagement in physical activities must be explained for the population, the physical education professional is in second place, losing out to television as the means of disclosure of this type of behavior. In regard to the school environment, physical education teachers may play an important role in acquisition and maintenance of healthy lifestyles on the part of students, although the data are controversial²⁴, but for this to happen, in addition to good didactic skills, the teacher needs to have a good level of knowledge about the matter he will deal with.

Analysis of correlation between the scores for items of knowledge showed values considered to be from moderate to low, showing that there is not a relationship between these items in the population considered in the present study. The greatest correlation observed ($r=0.33$) occurred between knowledge regarding a sedentary lifestyle and poor eating habits, which may be explained by the amount of publicity available regarding such lifestyle habits, indicating that good quality of life may be achieved by being active and eating properly²⁵.

Upon comparing the knowledge scores of our study with those of Borges et al.¹² who discussed the same theme, also carried out in the city of Pelotas, RS (although it was a population-based study), teachers' knowledge, despite being greater as compared to the general population, is a cause for concern since the researchers expected a greater rate of right answers as these professionals are fundamental players in teaching healthy habits to people who are being educated. Although there is no gold standard for knowledge, the results of the present study, when compared to a population based study which used the same instrument, indicate that the teachers know less about the associations between smoking, poor eating habits and abusive alcohol consumption with the diseases studied when compared to the population in general, which indicates at least that they are not updated in their field of education.

CONCLUSIONS

In general, the greatest average score for knowledge was in regard to a sedentary lifestyle, followed by poor eating habits, smoking and excessive alcohol consumption. In addition, the highest scores for knowledge were related to lower age groups, to the place of work and work hours.

These results are a cause for concern because the school, which should be the place where children and adolescents learn how to deal with risk factors associated with chronic diseases in adult life, does not seem to be achieving such aim, at least in the case of the subject of physical education. Government policies aimed at health and education are indispensable and urgent to renew the qualifications of teachers and prepare them to accomplish this task.

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