

Sexual dysfunction symptoms in men age 40 or older: Prevalence and associated factors

Sintomas de disfunção sexual em homens com 40 ou mais anos de idade: prevalência e fatores associados

Abstract

Objective: This study aimed to identify factors associated with sexual symptoms of aging male's in a representative sample of men aged 40 or older from Pelotas, southern Brazil. **Methods:** We performed a population-based cross-sectional study including 421 men who lived in urban area. To evaluate the sexual symptoms of aging male's was used the sexual dimension of the AMS scale - The Aging Male's Symptoms Scale. **Results:** The prevalence of sexual symptoms of male aging was 64.3% (95% CI: 59.3%-69.1%). Multivariable analysis identified direct association with age and inverse association with health self-rated. **Conclusion:** We conclude that the prevalence of sexual symptoms in older males is high and important. Public health policies coupled with increased healthy lifestyle habits could minimize the prevalence and provide better quality of life for middle-age and older men.

Keywords: Sexual disorder. Aging. Male. Erectile dysfunction. Cross-sectional studies. Epidemiology.

Leandro Quadro Corrêa^{I,II,III}

Marcelo Cozzensa da Silva^{I,III}

Airton José Rombaldi^{I,III}

^IPostgraduate Program in Physical Education at the Federal University of Pelotas, RS, Brazil.

^{II}Anhanguera Colleges of Pelotas, RS, Brazil.

^{III}Study Group of Physical Activity Epidemiology at the Federal University of Pelotas, RS, Brazil.

Corresponding author: Airton José Rombaldi. Rua Luis de Camões, 625 - Bairro Areal, 96055-630 Pelotas, RS, Brazil. E-mail: rombaldi@brturbo.com.br

Resumo

Objetivo: O estudo objetivou verificar os fatores associados aos sintomas sexuais do envelhecimento masculino em uma amostra representativa em homens com idade igual ou superior a 40 anos da cidade de Pelotas, RS. **Métodos:** Foi realizado um estudo transversal de base populacional, incluindo 421 homens que residiam na zona urbana do município. Para avaliar os sintomas sexuais do envelhecimento masculino foi utilizada a dimensão sexual da escala AMS - *The Aging Male's Symptoms Scale*. **Resultados:** A prevalência dos sintomas sexuais do envelhecimento masculino foi de 64,3% (IC 95%: 59,3%-69,1%). Na análise multivariável o desfecho esteve associado diretamente idade e inversamente a auto-percepção de saúde. **Conclusão:** Concluiu-se que a prevalência de sintomas sexuais na população masculina é importante. Políticas de saúde pública aliada ao aumento de hábitos de vida saudáveis poderiam minimizar esta prevalência e proporcionar melhor qualidade de vida a homens de meia idade e idosos.

Palavras-chave: Disfunção sexual. Envelhecimento. Disfunção erétil. Homens. Estudos transversais. Epidemiologia.

Introduction

Estimates from the World Health Organization (WHO) show that the proportion of individuals aged 60 years or more will increase from 11% to 22% between 2000 and 2050 and that 80% of them will be living in impoverished and developing countries by the end of this period¹. The social visibility of this sector of the population is a phenomenon found in all countries that managed to increase their life expectancy through advances that combine medicine and the environment¹.

The repercussions of the aging process on sexuality are an issue riddled with historical and cultural prejudices². This area of research has been neglected due to both a lack of interest by health professionals (general practitioners, geriatricians, gerontologists, nurses, nutritionists, physiotherapists, and physical educators) and the inhibition of older individuals to approach this subject. This inhibition can be attributed to the internalization of predominant social norms³.

With regard to male aging, symptoms have been studied in diverse populations and their prevalence has varied between 18% and 22.7%, tending to aggravate with the advance of age⁴⁻⁷. The smoking habit, poor perception of health and physical inactivity are among the factors associated with these symptoms⁵.

Aging includes characteristics such as the reduction in muscle mass and strength, osteopenia, the increase in abdominal fat (mainly visceral with insulin resistance and an atherogenic lipid profile). As a result of these physiological characteristics, including the reduction in the concentration of testosterone, male aging-related symptoms appear, such as the reduction in libido and pubic hair, depression, insomnia, profuse sweating, and the decrease in one's overall well-being. Such symptoms have psychological, somatic and sexual characteristics⁸⁻¹⁰.

With regard to sexual symptoms, they are operationally characterized as a set of factors associated with the reduction in sexual capacity/frequency, decreased nocturnal penile

tumescence, decrease in libido, decrease in facial hair growth, and the perception of having already reached one's peak of life, and they jointly describe the symptomatology⁶. The prevalences of these types of symptoms have varied between 27.8 and 66.2% in the population studied⁵⁻⁷ and few studies have dealt with the factors associated with them, especially in Brazil. Additionally, the aging process does not begin at the age of 60 years. In this sense, the early identification of sexual symptoms of aging can contribute to an early diagnosis, thus determining the need for clinical treatment.

In this sense, the present study aimed to verify the factors associated with sexual symptoms of male aging in a representative sample of men aged 40 years and more, living in the urban area of the city of Pelotas, RS, Southern Brazil.

Methods

A population-based cross-sectional study was conducted in the urban area of the city of Pelotas, RS, Southern Brazil, in 2008. This city is located in the southernmost state of Rio Grande do Sul and it has nearly 340,000 inhabitants. Nearly 32% of the population in this city is aged 40 years and more¹¹.

The *Instituto Brasileiro de Geografia e Estatística* (IBGE – Brazilian Institute of Geography and Statistics) divides this city into 408 urban census tracts, which are ordered in the shape of a spiral, from the city center to the districts. Of all 404 sectors including households, 45 were randomly selected to be included in this study. The starting point of the study was identified in each census tract drawn, from which the households to be visited were systematically selected. After selecting the first household to be included in the study, the following ones were systematically selected, respecting the pre-established interval of five households, until 20 households were obtained in each sector, so that the expected number of individuals in the sample calculation could be achieved.

Two calculations were performed to define the sample size required for this study, one for the prevalence of symptoms and another for the associated factors. The prevalence calculation included a larger sample size, considering an estimated prevalence of 60% of aging symptoms for men aged 40 years and more, an acceptable error of 5% and significance level of 95%. The sample size initially calculated was comprised of 384 men. An additional 10% was included for losses and refusals, so that the final sample totaled 421 individuals aged 40 years and more.

In all, 900 homes were selected, where all men aged 40 years and more were initially considered to be eligible for this study. The following individuals were excluded: those who were institutionalized (retirement homes, hospitals, prisons and army barracks), those with severe motor disability (quadriplegic individuals and those with cerebral palsy, among others), and those who could not understand and/or answer the questionnaire. Individuals who were not found in their homes after three visits made by the interviewer and one visit by a field work supervisor were considered as losses. Those who did not want to answer the questionnaire after three attempts made by the interviewer and one attempt by the supervisor were considered as refusals.

The outcome, sexual symptoms of male aging, was assessed with a group of questions (questions 12, 14 through 17) from the Aging Male's Symptoms Scale (AMS), validated by Heineman et al.⁶. This scale is comprised of 17 questions divided into three main sections: section of psychological factors, section of somatic factors, and section of sexual factors. Each question can provide a score from one to five points and the sum of the total score indicates the severity of symptoms. The sexual dimension is basically comprised of five symptoms: potency disorders, decreased nocturnal penile tumescence, reduced libido and sexual activity, decreased facial hair growth, and the perception of having already reached one's peak of life.

The sexual sub-score categorizes individuals as follows: without symptoms or with very weak symptoms when scoring up to five points; with weak symptoms, between six and seven points; with moderate symptoms, between eight and nine points; and with severe symptoms, when scoring ten or more points⁶. However, for the purposes of the analysis, this score was dichotomized and men with moderate to severe symptoms were considered as having sexual symptoms of male aging.

Demographic, socioeconomic and health characteristics were assessed with a pre-tested standardized questionnaire in a census tract which was not part of the sample (pilot study; n = 20). The independent variables were age (in complete years); ethnicity (white, black or mixed, according to interviewers' perception); marital status (with a partner, without a partner); socioeconomic level – determined according to the ABEP (Brazilian Association of Market Research Companies) classification (A – the highest level; B; C; D/E); level of education (in years of school completed); smoking (current smoker; ex-smoker; has never smoked); and self-perception of health (excellent; very good; good; fair; poor). Nutritional status was determined with the body mass index (BMI), calculated from the self-reported weight and height measurements and classified according to the WHO criteria¹³. The long version of the International Physical Activity Questionnaire (IPAQ)¹⁴ was used to define the physical activity score of participants. Individuals performing a minimum of 150 minutes/week of physical activities were considered to be active, according to the American College of Sports Medicine recommendations¹⁵.

This instrument was applied face-to-face by interviewers of both sexes who had completed secondary education or higher and who had received 40 hours of training to apply such instrument, without being informed about the study objectives or hypotheses. These interviewers performed the interviews individually, with the exception of the section of sexual symptoms, which

was self-administered so as to guarantee the anonymity of information, not exposing participants and minimizing refusals (those who answered the questionnaire received an envelope with the questions and their document was sealed right after they answered it). Those who did not have conditions to read or understand the questions could request an interviewer to do so for them (n = 14).

Field work supervisors re-applied the interview to 10% of the sample (n = 40), randomly selected with a reduced questionnaire that included key questions obtained from the instrument that controls the quality of the study.

The database was constructed using the Epi Info software, version 6.0, and double data entry was performed for each questionnaire. Data were analyzed with the STATA software, version 9.0. A descriptive analysis of sample participants was performed, according to sexual symptoms and socioeconomic, demographic, behavioral, nutritional and health variables. The crude analysis verified the relationship between the outcome and independent variables, using the chi-square test for heterogeneity and linear trend. The multivariate analysis was conducted with Poisson regression¹⁶, according to a hierarchical model of the relationships among variables¹⁷ comprised of four levels. On the most distal level, age and ethnicity were included; on the second level, marital status, level of education and socioeconomic level; on the third level, BMI, smoking and physical activity level; and, on the most proximal level, sexual symptoms of male aging and self-perception of health. The effects of variables were controlled for the variables on the same level and on higher ones and those with a p-value ≤ 0.2 remained in the analysis. The significance level established was 5%.

The present research project was approved by the Research Ethics Committee of the School of Physical Education of the Federal University of Pelotas (protocol 005/2008) and data were only collected after participants signed an informed consent form.

Results

A total of 421 men aged 40 years and more were studied in 876 households, with 8.3% of losses and refusals. The design effect found (0.7) was sufficient to maintain the expected strength and confidence level in this study.

The mean age of the interviewed men was 54.5 ± 10.5 years (varying from 40 to 90 years) and 29.9% had up to four years of study. Of all participants, nearly 85% were white, almost half were on socioeconomic level C (46.2%) and 77.2% were married or lived with a partner. Additionally, 20% were current smokers, 67.1% had a BMI corresponding to overweight/obesity and 37.2% were physically inactive (Table 1). The median time spent on physical activities was 223.0 minutes/week, ranging between zero and 8,650 minutes.

The prevalence of sexual symptoms of male aging was 64.3% (95%CI; 59.3% - 69.1%). In the crude analysis (Table 2), sexual symptoms of male aging were directly associated with age and inversely associated with level of education and self-perception of health of participants. In the multivariate analysis (Table 3), after adjusting for confounding factors, the level of education lost significance and age and self-perception of health remained significantly associated with the outcome.

The prevalence of the presence of sexual symptoms of male aging according to age showed a significant linear increase and those aged 70 years and more had an 80% higher risk of having this type of symptom than others aged between 40 and 49 years.

With regard to self-perception of health, there was a significant linear increase in the presence of this outcome and those who perceived their health as poor had a 40% higher risk of having sexual symptoms of male aging than others who perceived it as excellent (Table 3).

Discussion

The present study identified a high

prevalence of sexual symptoms of male aging. Additionally, there was an association between these symptoms and a more advanced age and poorer self-perception of health.

The prevalence of the outcome in the present study was approximately 64%, which corroborates the findings of Ichioka et al.⁷ in a study performed in Japan, which found a prevalence of 66.2%. However, it is significantly different from the results of Heinemann et al.⁶, who found a prevalence of 28.7% of sexual symptoms of male aging in a study performed in Germany. In a study conducted in Nigeria⁴ with older men aged 60 years and more, the prevalence of moderate and severe sexual symptoms was 23.5% and 51.5%, respectively.

A study conducted in 2007¹⁸ in some Brazilian state capitals, using the same scale of the present study (AMS - The Aging Male's Symptoms Scale), reported a prevalence of moderate and severe symptoms of early male aging of 13.3%. The difference in prevalence, when compared to the present study, can be attributed to the differences in sample selection process of the above mentioned study, where almost all volunteers had a high level of education, thus not representing the male population.

The present study observed that older men have a higher risk of having sexual symptoms of aging than younger ones, a result corroborated by other studies¹⁹⁻²². Qiu et al.²² reported that more than 50% of the men studied aged more than 70 years had already interrupted their sexual activities for at least two years, when compared to those aged between 60 and 64 years, due to severe erectile dysfunction problems.

Self-perception of health was also inversely associated with sexual symptoms of male aging in the sample studied. This inverse association has been identified in previous studies^{3,21} and, in the present study, those who perceived their health as poor had a 40% higher risk of having this type of symptom than others who perceived their health as excellent. In a recent study, Corrêa et al.⁵ reported that this variable was

Table 1 - Sample characteristics according to independent variables (n = 390).**Tabela 1** - Descrição da amostra de acordo com as variáveis independentes em estudo (n = 390).

Variables	N	%
Age (in complete years)		
40-49	150	38.5
50-59	126	32.3
60-69	73	18.7
70 and more	41	10.5
Ethnicity		
White	334	85.6
Black	32	8.2
Mixed	24	6.2
Level of education (in years of school completed)		
0	13	3.3
1-4	100	25.6
5-8	135	34.6
9-11	72	18.5
12 or more	70	18.0
Socioeconomic level		
A (the highest level)	31	8.1
B	129	33.6
C	178	46.4
D/E	46	11.9
Marital status		
Married or with a partner	304	77.9
Without a partner	86	22.1
BMI (kg/min²)		
Normal weight	123	32.9
Overweight	171	45.7
Obesity	80	21.4
Smoking		
Has never smoked	116	29.7
Ex-smoker	165	42.3
Current smoker	109	28.0
Total physical activity level		
Inactive	140	36.2
Active	247	63.8
Self-perception of health		
Excellent	37	9.5
Very good	54	13.8
Good	205	52.6
Fair	74	19.0
Poor	19	4.8
Moderate/severe sexual symptoms		
No	139	35.6
Yes	251	64.4

IMC = Body mass index / IMC = Índice de massa corporal

Table 2 - Prevalence of aging's sexual symptoms in men and crude association between symptoms and independent variables.

Tabela 2 - Prevalência de sintomas sexuais do envelhecimento masculino e associação bruta entre sintomas sexuais e variáveis independentes em estudo.

Variables	N	%	Crude analysis	
			PR (95%CI)	p-value
Age (in complete years)				<0.001**
40-49	69	46.0	1.0	
50-59	87	69.1	1.5 (1.1 to 1.9)	
60-69	59	80.8	1.8 (1.4 to 2.2)	
70 and more	36	87.8	1.9 (1.5 to 2.4)	
Ethnicity				0.6*
White	217	65.0	1.0	
Black/mixed	33	61.1	0.9 (0.7 to 1.2)	
Level of education (in years of school completed)				0.03**
0	12	92.3	1.0	
1-4	67	67.0	0.7 (0.6 to 0.9)	
5-8	88	65.2	0.7 (0.6 to 0.9)	
9-11	47	65.3	0.7 (0.6 to 0.9)	
12 or more	37	52.9	0.6 (0.4 to 0.8)	
Socioeconomic level (ABEP)				0.5**
A (the highest level)	20	64.5	1.0	
B	79	61.2	0.9 (0.7 to 1.2)	
C	116	65.2	1.0 (0.7 to 1.4)	
D/E	32	69.6	1.1 (0.8 to 1.5)	
Marital status				0.6*
Married or with a partner	198	65.1	1.0	
Without a partner	53	61.6	0.9 (0.8 to 1.2)	
BMI (kg/m²)				0.5**
Normal weight	77	62.6	1.0	
Overweight	106	62.0	1.0 (0.8 to 1.2)	
Obesity	55	68.8	1.1 (0.9 to 1.4)	
Smoking				0.5*
Has never smoked	68	58.6	1.0	
Ex-smoker	115	69.7	1.2 (1.0 to 1.4)	
Current smoker	68	62.4	1.1 (0.9 to 1.3)	
Physical activity level (minutes/week)				0.7*
Active	158	64.0	1.0	
Inactive	92	65.7	1.0 (0.9 to 1.1)	
Self-perception of health				<0.001**
Excellent	19	51.4	1.0	
Very good	27	50.0	1.0 (0.7 to 1.4)	
Good	131	64.0	1.2 (0.9 to 1.8)	
Fair	56	75.7	1.5 (1.0 to 2.2)	
Poor	17	89.5	1.7 (1.2 to 2.5)	

* Chi-square for heterogeneity; ** Chi-square for linear trend; IMC = Body mass index

* Qui-quadrado para heterogeneidade; ** Qui-quadrado para tendência linear; IMC = Índice de Massa Corporal

Table 3 - Multivariate analysis of association between sexual symptoms and independent variables.

Tabela 3 - Análise multivariável da associação entre os sintomas sexuais do envelhecimento masculino e variáveis independentes em estudo.

Variables	Adjusted analysis	
	PR (95%CI)	p-value
Age (in complete years)		< 0.001*
40-49	1,0	
50-59	1.5 (1.2 to 1.9)	
60-69	1.7 (1.4 to 2.1)	
70 and more	1.8 (1.4 to 2.3)	
Level of education (in years of school completed)		0.6
0	1.0	
1-4	0.9 (0.7 to 1.1)	
5-8	1.0 (0.8 to 1.2)	
9-11	1.1 (0.8 to 1.4)	
12 or more	0.8 (0.6 to 1.1)	
Self-perception of health		0.01*
Excellent	1.0	
Very good	0.9 (0.6 to 1.4)	
Good	1.2 (0.9 to 1.7)	
Fair	1.3 (0.9 to 1.9)	
Poor	1.4 (1.0 to 2.1)	

* Wald test for linear trend / *Teste de Wald para tendência linear

associated in a linear fashion with male aging symptoms. In other studies, this variable was associated with the indicator of early mortality and with the presence of a higher number of chronic diseases in men who perceived their health as poor²³⁻²⁵.

In a study conducted by Justo et al.²⁶, the presence of coronary artery disease was directly associated with erectile dysfunction and the absence of sexual relations in older men. In a study conducted in Europe²⁰, the decrease in sexual health was associated with comorbidities such as hypertension, obesity and heart diseases, apart from the impairment in sexual function being related to poorer quality of life, when men aged more than 70 years were compared with those aged between 60 and 64 years.

In this perspective, aging is usually associated with sexual problems that may originate from certain types of diseases resulting

from the natural aging process itself.

Despite the relevance, applying a questionnaire about the frequency of sexual performance, nocturnal penile tumescence and desire was challenging, as these variables are intimate experiences for study participants, although they were collected in an anonymous self-administered way and confidentiality of information was guaranteed. The fact that the questionnaire was self-administered and thus required participants to know how to read was not an important problem, as more than 96% of participants could read and select the corresponding alternatives. In the situations when the interviewer had to intervene to read or clarify a question, the confidentiality of the alternatives selected was guaranteed most times.

One of the study limitations was the lack of information about the presence

of certain types of diseases that could be associated with the outcome and become confounding sources in the relationship between certain exposures and the outcome; another possibility is that reverse causality may have occurred, as it usually does in studies with a cross-sectional design, as the information about the outcome and determining factors was collected simultaneously, especially with regard to physical activity level and self-perception of health. The results could also have been affected by participants' information bias. Men could have overestimated the information about sexual behavior; however, based on the high prevalence of symptoms, it appears that this was not the case. An aspect that stands out in this study is that the sample can be considered to be representative of male adults aged 40 years and more, living in the city of Pelotas, according to the high percentage of individuals interviewed, the multiple-stage random sampling process, and the low rate of refusals and losses (8.3%). Additionally, the socio-demographic characteristics were in agreement with the census data for this city¹¹. Another aspect to be considered

is that the results found are important for health professionals who work with male aging, helping them to identify symptoms early and to improve patient counseling, seeking specialized support when necessary.

It could be concluded that there is a high prevalence of sexual symptoms in the male population aged 40 years and more, which could affect their perception of health and quality of life. The earlier these symptoms are diagnosed, the greater the chance of treatment and, consequently, the lower the chance of physical and mental health disorders. Health professionals who work with this study population must pay attention to early sexual symptoms of male aging, in view of their negative impact on adult life.

Authors' contributions:

Leandro Quadro Corrêa, Marcelo Cozzensa da Silva and Airton José Rombaldi conducted the literature review and performed the analyses, table and figure design, interpretation and description of results, and discussion. Leandro Quadro Corrêa supervised the field work. All authors approved the final version of the manuscript.

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Received: 16/01/12
 Final version: 03/08/12
 Approved: 31/10/12