

# The Prevalence and Risk Factors of Sexual Dysfunction in the Elderly in Southern China

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**Objective:** This study aims to evaluate the epidemiological features of sexual dysfunction in people aged more than 65 years in parts of China, and to investigate the independent significant risk factors.

**Methods:** According to the population distribution of five communities in Xiamen and Chongqing, we have randomly enrolled 2403 people more than 65 years-of-age. We collected data information through a questionnaire survey. Then demonstrated the current condition of sexual dysfunction in the samples by statistical analysis, and multivariable logistic regression was used to disclose the risk factors of sexual dysfunction in the older adults.

**Results:** According to this study, about 10.48% of the elderly had sexual dysfunctions of different degrees and duration. The proportion of men was about twice that of women (14.5% of males and 7.3% of females). During the course of the disease, 3.19% (43/1344) of women and 3.31% (35/1059) of men had more than 15 years duration of sexual dysfunction. In severity, 5.7% (77/1344) of women and 7.0% (74/1059) of men had very severe sexual dysfunction. There were statistically significant differences in BMI, smoking, drinking history, hypertension, depression incidence or median ( $p < 0.05$ ). Alcohol consumption history [OR = 1.711, 95% CI: 1.124–2.604,  $p = 0.012$ ] and depression [OR = 2.107, 95% CI: 1.109–4.356,  $p = 0.044$ ] were independent risk factors for sexual dysfunction.

**Conclusion:** The prevalence of sexual dysfunction was low among elderly in the southern part of China. But the course of the disease is long and the degree of the disease is very severe. Elderly with a history of drinking and depression are more prone to sexual dysfunction.

**Keywords:** epidemiology, sexual dysfunction, elderly, prevalence, risk factor

## Introduction

Sexual functioning is an integral component of personal life for all ages. Sexual dysfunction includes difficulty in erection, decrease or loss in libido, uncomfortable genital sensations (painful, burning, numbness), and so on. More and more studies have demonstrated that sexual dysfunction is affected by neurological disorders,<sup>1</sup> endocrine disease,<sup>2</sup> airway disorders such as obstructive sleep apnoea,<sup>3</sup> gastrointestinal disorders,<sup>4</sup> and mental disorders in both female and male patients. Some studies have focused on sexual dysfunction in men, which has been recognized as a complication of diabetes<sup>5</sup> and sexual dysfunction in females who are pregnant.<sup>6</sup> But it is difficult to know the true prevalence of sexual dysfunction because of the variations in classification and changes in diagnostic criteria. Sexual dysfunction as a kind of symptom of autonomic nervous system dysfunction, tends to occur in the elderly. Most studies have investigated sexual function in old patients with Parkinson's disease or MSA (multiple system atrophy).<sup>7</sup> However, few studies have demonstrated the prevalence and incidence of sexual dysfunction in the elderly in China. As sexual health is an important issue and patients themselves might be embarrassed to tell their doctor about their sexual dysfunction, this study aimed to fill this gap in the literature. The first aim of our study was to demonstrate the prevalence rate of sexual dysfunction in the elderly in parts of China. The second aim was to analyze the risk factors affecting sexual dysfunction.

## Methods

### Study Group

This study focuses on the prevalence and risk factors about sexual dysfunction in old people based on the data collected from questionnaires. Our study sample were derived from five communities in Xiamen and Chongqing who were assessed separately, between May and August 2021. The inclusion criteria: age is over or equal to 65 years old; including local permanent residents or outsiders (live for more than 1 month); and agree to participate in the investigation. Exclusion criteria: 1) Foreigners living in the local area for less than one month. 2) Subjects who refuse to cooperate with the investigation. Investigators consider other reasons for not being selected, such as not being able to speak Mandarin and not being able to answer autonomously. The respondents with sexual dysfunction were selected for the sexual dysfunction group, and the respondents without sexual dysfunction were selected for the control group. The total number of participants included in the study was 2403, including 1059 males and 1344 females, aged 65–96 years, with a median of 73 years.

### Questionnaire

A team of 25 trained and certified medical and community workers conducted door-to-door questionnaires and face-to-face interviews with respondents, conducting at least 2800 visits using consistent and uniform language guidance. Finally, 2403 respondents were successfully enrolled with an effective rate of 85.8%. The main outcome measure was the presence of sexual dysfunction. Presence of a sexual dysfunction was ascertained on the basis of the participants' answers to two questions about sexual life that were asked as part of a questionnaire in communities that were selected randomly at Xiamen and Chongqing. Those questions were not a part of a validated questionnaire and the purpose of including them in the health survey was to study subjective perceptions of the old people about their sexual life.

The survey consisted of two parts. The first part included questions about the sociodemographic characteristics, medical history, social activity, smoking and drinking history, and so on. The second part was regarding sexual function, the question was “Do you have erectile dysfunction (male) or sexual apathy (female)? And how long for?” The scale score range is 1 to 4, with bigger score being associated with worse sexual function. Prior to asking the two questions on sexual function, we told the participants that these questions may be perceived as being sensitive, but we asked them to answer them as well as they could.

### Statistical Analysis

All data analyses were conducted using IBM SPSS Statistics, version 25, and a p-value < 0.05 was considered as significant. We used several tests to estimate the prevalence of the sexual dysfunction and demonstrate the characteristic about socio-demographic and medical. Then, multivariable logistic regression analysis was performed to estimate the odds ratios (ORs) and 95% confidence intervals (CIs) for the associations between sexual dysfunction and the explanatory variables.

## Results

### Sociodemographic Characteristics

The subject's characteristic are presented in [Table 1](#). In total, 2403 participants filled out the questionnaire, the prevalence of sexual dysfunction was 10.48% (252/2403). This study including 1059 males (44.1%) and 1344 females (55.9%), there were 98 women and 154 men in the sexual dysfunction group. Aged 65–96 years, with a median of 73 years. A total of 16.2% were living in a rural area and 83.8% were living in an urban area. In the sexual dysfunction group, 94.4% participants were living in urban regions ( $p < 0.001$ ). The levels of education included illiteracy, primary school and above, 290 respondents were illiterate, 726 respondents were primary school level and 1387 respondents were more than primary school level. Moreover, 1875 were married (78.0%) and 528 (22%) were not.

### The Duration of Sexual Dysfunction

Among the elderly in the southern part of China, 1.56% (21/1344) of women and 4.43% (47/1059) of men had sexual dysfunction lasting <5 years; 1.79% (24/1344) of women and 4.91% (52/1059) of men had 5–10 years duration of sexual

**Table 1** Distribution (% , n) and Anthropometric Data (Median, Standard Deviations) of Background Variables of Participants, n = 2403

	Total (n=)	Control Group (n =)	Sexual Dysfunction Group (n =)	P
Gender				<0.001
Female	1344 (55.9)	1246 (57.9%)	98 (38.9%)	
Male	1059 (44.1%)	905 (42.1%)	154 (61.1%)	
Age	73 (69–78)	73 (69–78)	72.5 (69–78)	0.895
Living in region				<0.001
Urban	2014 (83.8%)	1776 (82.6%)	238 (94.4%)	
Rural	389 (16.2%)	375 (17.4%)	14 (5.6%)	
Education				0.020
Illiteracy	290 (12.1%)	273 (12.7%)	17 (6.7%)	
Primary school level	726 (30.2%)	649 (30.2%)	77 (30.6%)	
Above	1387 (57.7%)	1229 (57.1%)	158 (62.7%)	
Marriage				0.256
Single	43 (1.8%)	41 (1.9%)	2 (0.8%)	
Married	1875 (78.0%)	1667 (77.5%)	208 (82.5%)	
Divorced	74 (3.1%)	68 (3.2%)	6 (2.4%)	
Widowed	411 (17.1%)	375 (17.4%)	36 (14.3%)	
BMI	23.03 (20.81, 25.44)	23.15 (20.83, 25.63)	22.11 (20.44, 24.21)	<0.001
Smoking	550 (22.9%)	455 (21.2%)	95 (37.7%)	<0.001
Drinking	489 (20.3%)	406 (18.9%)	83 (32.9%)	<0.001
Diabetes	422 (17.6%)	384 (17.9%)	38 (15.1%)	0.314
Hypertension	1053 (43.8%)	908 (42.2%)	145 (57.7%)	<0.001
Depression	55 (2.3%)	43 (2.0%)	12 (4.8%)	0.011
Headache	149 (6.2%)	132 (6.1%)	17 (6.7%)	0.809
Cerebrovascular disease	165 (6.9%)	144 (6.7%)	21 (8.3%)	0.400
Cardiovascular disease	250 (10.4%)	225 (10.5%)	25 (9.9%)	0.876
Dementia	375 (15.6%)	338 (15.7%)	37 (14.7%)	0.738

**Note:** P < 0.05 are significant.

**Abbreviation:** BMI, body mass index.

dysfunction; 0.74% (10/1344) of women and 1.89% (20/1059) of men had 10–15 years duration; 3.19% (43/1344) of women and 3.31% (35/1059) of men had more than 15 years duration of sexual dysfunction. As shown in [Table 2](#).

## The Severity of Sexual Dysfunction

Among the survey, 0.9% (12/1344) of women and 2.8% (30/1059) of men had mild sexual dysfunction; 0.4% (5/1344) of women and 3.3% (35/1059) of men were moderate; 0.3% (4/1344) of female and 1.4% (15/1059) of male had severe sexual dysfunction; and 5.7% (77/1344) of women and 7.0% (74/1059) of men had very severe sexual dysfunction. As shown in [Table 3](#).

**Table 2** The Duration of Sexual Dysfunction in Chinese Older Adults

	Female	Prevalence (%)	Male	Prevalence (%)
<5 years	21	1.56%	47	4.43%
5–10 years	24	1.79%	52	4.91%
10–15 years	10	0.74%	20	1.89%
>15 years	43	3.19%	35	3.31%
$\chi^2$		12.588 <sup>a</sup>	p	=0.006

**Notes:** <sup>a</sup>The chi-square statistic is 12.588. p: The P-value is 0.006. The results are significant statistically at P < 0.05.

**Table 3** The Severity of Sexual Dysfunction in Chinese Older Adults

	Female	Male
Number of mild patients (cases)	12	30
Prevalence (%)	0.9%	2.8%
Number of moderate patients (cases)	5	35
Prevalence (%)	0.4%	3.3%
Number of severe patients (cases)	4	15
Prevalence (%)	0.3%	1.4%
Number of very severe patients (cases)	77	74
Prevalence (%)	5.7%	7.0%
$\chi^2$	57.712 <sup>a</sup>	p
		<0.001

**Notes:** <sup>a</sup>The chi-square statistic is 57.712. p: The P-value is <0.001. The results are significant statistically at P < 0.05.

**Table 4** The Multivariable Logistic Regression Analysis of Risk Factors for Sexual Dysfunction

	Multivariate Logistic Regression Analysis		
	OR	OR 95% CI	P
Drinking	1.711	1.124–2.604	0.012
Depression	2.107	1.109–4.356	0.044

**Note:** P < 0.05 are significant.

**Abbreviation:** CI, confidence interval.

## Multivariable Logistic Regression Analysis

The characteristic data were analyzed and the main outcome are demonstrated in Table 1. Of the risk factors: smoking and drinking history, hypertension and depression between the control group and the sexual dysfunction group were significant differences in the rate or median (all p < 0.05). Then, multivariable logistic regression analysis showed that those with a drinking history [OR = 1.711, 95% CI: 1.124–2.604, p = 0.012] and/or depression [OR 2.107, 95% CI: 1.109–4.356, p = 0.044] were vulnerable to sexual disorder (Table 4).

## Discussion

Our study found a prevalence of sexual dysfunction of 104.8 per 1000 (252/2403) among the elderly in the southern parts of China. Compared with previous studies in regions of Europe and America, this study seems to show a lower prevalence of sexual dysfunction in the elderly.<sup>8</sup> A Malaysian study showed that the prevalence of erectile dysfunction was 18.5% for men 60–69 years, and 29.5% for men 70–79 years old.<sup>9</sup> Female sexual dysfunction affected 30–50% of women.<sup>10</sup> It is difficult to compare findings because of the different ways sexual dysfunctions are determined and the population from which the sample was drawn. There were different prevalences of sexual dysfunction in different age groups: 92 (11.2%) respondents aged 65–70 years, 111 (9.38%) aged 71–80 years and 49 (12.06%) aged more than 81 years. This study shows that the prevalence of sexual dysfunction among elderly in the southern parts of China were higher at 65–70 years old and for those more than 81 years old, while it was relatively low at the 71–80 years level.

The prevalence of sexual dysfunction in the male older adult was higher than the female. Moreover, the duration of the disease in Chinese elderly was varied, ranging from 1–5, 5–10 and more than 15 years, and men had a higher incidence than women in any duration of disease. Regarding the severity of disease, 5.7% of women and 7.0% of men had very severe sexual dysfunction. Though this study has shown a low prevalence in the elderly in southern China, at the same time, this study shows that sexual dysfunction not only has a long duration but is also more severe. It seriously affects the quality of life of the older adults in southern China and the relevant health department should pay attention to this condition.

In term of risk factors, this study found smoking, drinking, hypertension and depression as potential risk factors of sexual dysfunction in the elderly. However, there was no relationship between sexual dysfunction and age, marital status, diabetes, cardiovascular diseases and dementia. Many previous studies had shown age, diabetes and dementia were independent risk factors of sexual dysfunction.<sup>11–13</sup> The reasons for the different results may lie in the different region and relatively small sample size. However, this study aimed to explore the region specific prevalence and the risk factors of sexual dysfunction. Multivariable logistic regression analysis showed drinking and suffering from depression were the independent risk factors of sexual dysfunction in the old people in parts of China. Previous studies have demonstrated a significant correlation between drinking and increased risk of sexual dysfunction in male or female patients.<sup>14,15</sup> Alcohol consumption can induce a reduction in testosterone levels by inhibiting its synthesis, which affects libido and sexual potency.<sup>16</sup> These studies have shown that alcohol is a depressant that impairs sensory nerve input, resulting in decreased libido, arousal, and intensity.<sup>17</sup> The findings are similar to ours, indicating that chronic alcohol use is associated with sexual dysfunction in various aspects.<sup>18</sup> Depression is common in the elderly,<sup>19</sup> most studies show that depression is a risk factor for sexual dysfunction and its relationship should be viewed as two-way.<sup>20</sup> The most common psychological disorders in older men with sexual dysfunctions include alcohol abuse and depression.<sup>21</sup> Selective serotonin reuptake inhibitors are commonly associated with sexual dysfunction in men and women.<sup>22</sup>

There are some limitations. First, this was a cross-section study, it could identify the prevalence of sexual dysfunction at a specific time point. Second, a small number of participants may have been embarrassed to admit the existent of sexual trouble. Many old adults consider the decline in sexual function with age as a normal phenomenon rather than a disease. Third, some members of the elderly who cannot move may not have been included in this study. Fourth, a simple questionnaire was used in this study. However, despite these limitations, the present study successfully identified three potential risk factors for sexual dysfunction in the elderly in parts of China. These results may provide evidence for recognizing and preventing sexual dysfunction in older adults.

## Conclusions

In conclusion, the prevalence of sexual dysfunction was low among elderly in the southern part of China. But the course of the disease is long and the degree of the disease is very severe. The elderly with a history of drinking and depression are more likely to be prone to sexual dysfunction. Which should be clinically recognised. Healthcare departments should give their old patients an opportunity to voice their concern with sexual function. Recognizing and ameliorating potential barriers to healthy sexual expression can improve quality of life for older adults.

## Data Sharing Statement

The unadjusted data that underlies the findings of this article will be accessible from the authors, free from any undue constraints.

## Ethics Statement

This study complies with the Declaration of Helsinki (2000) and received ethical approval from the Central Ethics Committee of Tianjin Huanhu Hospital (2019-40). All participants signed informed consent forms in this study.

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## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## Disclosure

The authors declare no conflicts of interest in this work.

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