

## Prevalence and Risk Factors for Erectile Dysfunction in Chinese Adult Males

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### ABSTRACT

**Background:** There is a lack of nationwide epidemiologic survey data on the prevalence estimate of erectile dysfunction (ED) in Chinese men living on the mainland China.

**Aim:** To attain the representative prevalence estimate of ED in the Chinese male population and to analyze potential risk factors associated with ED by demographics, socioeconomic status, and medical comorbidities.

**Methods:** The study was community based. The five-item International Index of Erectile Function questionnaire and in-person interview were used to obtain data. The survey subjects were 5,210 non-institutionalized Chinese men at least 40 years old residing in 30 provinces and autonomies of China. Multiple logistic regression analysis was used to disclose risk factors associated with ED.

**Outcomes:** The prevalence estimate of ED was 40.56% in Chinese men at least 40 years old.

**Results:** The prevalence of ED increased with increasing age. A significant high prevalence of ED was observed in men who smoked heavily, were estranged from a partner, had diabetes, and lower urinary tract symptoms from benign prostatic hyperplasia. Smoking more than 30 cigarettes daily and obesity (body mass index  $\geq 30$  kg/m<sup>2</sup>) significantly increased the risk for ED by multivariable-adjusted odds ratios. Stable or erratic sexual partners, personal incomes, alcohol consumption, and cardiovascular and/or cerebrovascular diseases were not risk factors associated with ED prevalence. Other sexual problems commonly seen in this group of men included difficulty achieving erectile rigidity, ejaculation, and climax during intercourse.

**Clinical Translation:** Knowledge on the prevalence of ED and its associated risk factors will help physicians in the clinical management and prevention of ED with the use of counseling for lifestyle adjustment and drug therapy.

**Strengths and Limitations:** Data on the influence of psychological conditions on ED were not collected. ED was not categorized as minor, moderate, or severe for analysis during processing of data.

**Conclusion:** The national representative prevalence of ED was determined for the first time in the Chinese male population. **Zhang X, Yang B, Li N, Li H. Prevalence and Risk Factors for Erectile Dysfunction in Chinese Adult Males. J Sex Med 2017;XX:XXX–XXX.**

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**Key Words:** Erectile Dysfunction; Prevalence; Risk Factors; Demographics; Socioeconomic Status; Medical Comorbidities

### INTRODUCTION

Erectile dysfunction (ED) is a common problem affecting more than 150 million men worldwide. ED is defined as the persistent inability to attain an erection sufficient to permit satisfactory sexual intercourse.<sup>1</sup> ED has biological, psychological, and social effects on the quality of life of

men and their sexual partners.<sup>2</sup> ED can cause frustration, anxiety, and depression in men and therefore can affect job performance, social activities, and family stability.<sup>3–5</sup> It is evident that ED has become a measurable health disorder for men globally that requires medical and public health attention.

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The prevalence of ED in different nations and races has been surveyed and the outcomes have been published in a substantial body of literature. The latest consensus from the Fourth International Consultation on Sexual Medicine in 2015 described a great variation of ED prevalence estimates based on studies published after 2000.<sup>6</sup> Higher prevalence estimates were reported in Southeast Asia (22–28%) and East Asia (27%) than in Europe, Central and South America, and the Middle East (8–15%).<sup>7–9</sup> Wong et al<sup>10</sup> reported the highest overall prevalence estimate of ED (88%) in a Chinese survey, in which severe ED was as high as 77%. However, the subjects in that survey were limited to the Hong Kong district of China. Another Chinese study involved 1,472 subjects from a region in northern China.<sup>11</sup> The ED prevalence was reported to be 78%, and prevalences of 55.3%, 88.2%, and 91.8% were found for men 40 to 49, 50 to 59, and 60 to 69 years old, respectively. Differences between the prevalence estimates of ED and the limits of these surveys imply the lack of true national prevalence estimates of ED in the non-institutionalized Chinese male population. Because of its population (1.4 billion) and use of global health care resources, it is very important to obtain the true prevalence of ED in China. This first nationwide and population-based study was designed to attain the representative prevalence estimate of ED in Chinese men at least 40 years old and to analyze risk factors associated with ED under different demographics, socioeconomic conditions, and medical comorbidities from Western countries. The data are essential not only to understand the current status of the epidemiology of ED in China and to develop adequate measurements, education programs, prevention, and treatment of ED, but also to provide future direction for studies on the etiology of ED.

## METHODS

### Study Population, Participant Selection, and Sample Distribution

This cross-sectional survey was directed to non-institutionalized Chinese men at least 40 years of age who inhabited the mainland of China from 2010 to 2013. The study was community based. Urologists, andrologists, physicians in general practice, nurses, and social workers from 76 local hospitals and communities across the nation were involved with the study. A series of public lectures on men's health were given. Male audience members were asked whether they are willing to take part in the survey. Men who agreed to be involved were selected and their medical histories were obtained. Those who had had severe diseases such as prostate cancer, heart diseases, or stroke and those who required assisted living were excluded from the study. Detailed instruction was given to discretionary participants before the survey questionnaire was completed. Questions relating to sexual activities were explained by the urologists and andrologists who administered the survey. All subjects consented by signing the informed consent form. The survey covered 30 provinces and autonomies except for Xinjiang

autonomies, Qinghai Province, Tibet, and Hong Kong. The study was approved by the medical ethic committee of the Peking Union Medical College Hospital (Beijing, China).

### Assessment of ED and Other Sexual Dysfunctions

Having been recognized as a valuable tool for diagnostics and epidemiologic studies of ED, the five-item International Index of Erectile Function (IIEF-5) questionnaire combined with interview in-person was used for the study. An IIEF-5 score no higher than 21 identifies ED.<sup>12</sup> Subjects with IIEF-5 scores no higher than 21 were interviewed further by urologists and andrologists for information about their sexual activities. This information included intercourse within a 1-month period (yes or no, frequency), erectile rigidity (from grade IV to I), ejaculation (weakened, difficult, or none), amount of semen (decreased or none), climax (yes or no), libido (high, average, low, or no), impulsive erection (yes or no), and specific reason for stopping sexual activities. The questionnaires were collected from 6,338 subjects.

### Assessment of Demographic, Socioeconomic Factors, and Medical Comorbidities

Information on age, sex, ethnicity, marital status, couples' relationship, sexual partners, sexual activity, smoking, drinking habits, education levels, personal incomes, and medical histories of cardiovascular and/or cerebrovascular problems, diabetes, and lower urinary tract symptoms (LUTS) from benign prostatic hyperplasia (BPH) were collected. Weight and waist and hip circumferences were measured and body mass index (BMI) and waist-to-hip ratio were calculated.<sup>13</sup> The information was subjected to prevalence estimates and risk analysis of innate, socioeconomic, and medical conditions associated with ED.

### Statistical Analysis

All statistical analyses were performed using SPSS 13.0 (SPSS, Inc, Chicago, IL, USA). The prevalence estimates of ED and its variations in different age groups were calculated. The raw and age-adjusted prevalences of ED by demographic, socioeconomic, and medical conditions were analyzed using  $\chi^2$  test. Age- and multivariable-adjusted odds ratios (ORs) and their 95% CIs were analyzed using multiple logistic regressions. A statistical significance level was set at a *P* value less than 0.05.

## RESULTS

### Prevalence Estimates of ED

The 5,210 completed questionnaires were counted as valid responses. The response rate was 82.2%. Of 5,210 Chinese men, 2,113 had IIEF-5 scores no higher than 21. Thus, the prevalence estimate of ED was 40.56% in the general Chinese male population at least 40 years old. The prevalence of ED increased steadily in relation to age (Table 1). There was a significant difference in ED prevalence among different age groups (*P* < .04

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