Prevalence of Erectile and Ejaculatory Difficulties among Men in Croatia

Aleksandar Štulhofer[1], Žarko Bajić[2]

[1]Department of Sociology, Zagreb University Faculty of Humanities and Social Sciences, Zagreb, Croatia

[2]Biometrika Healthcare Research, Zagreb, Croatia

> **Correspondence to:**
Aleksandar Štulhofer
Department of Sociology
Zagreb University Faculty of Humanities and Social Sciences
I. Lučića 3
10000 Zagreb, Croatia
astulhof@ffzg.hr

> **Received:** June 30, 2005
> **Accepted:** October 18, 2005

> **Croat Med J. 2006;47:114-24**

Aim To determine the prevalence and risk factors of erectile difficulties and rapid ejaculation in men in Croatia.

Method We surveyed 615 of 888 contacted men aged 35-84 years. The mean age of participants was 54 ± 12 years. College-educated respondents and the respondents from large cities were slightly overrepresented in the sample. Structured face-to-face interviews were conducted in June and July 2004 by 63 trained interviewers. The questionnaire used in interviews was created for commercial purposes and had not been validated before.

Results Out of 615 men who were sexually active in the preceding month and gave the valid answers to the questions on erectile difficulties and rapid ejaculation, 130 suffered from erectile or ejaculatory difficulties. Men who had been sexually active the month before the interview and gave the valid answers to the questions on sexual difficulties reported having erectile difficulties more often (77 out of 615) than rapid ejaculation (57 out of 601). Additional 26.8% (165 out of 615) and 26.3% (158 out of 601) men were classified as being at risk for erectile difficulties and rapid ejaculation, respectively. The prevalence of erectile difficulties varied from 5.8% in the 35-39 age group to 30% in the 70-79 age group. The association between age and rapid ejaculation was curvilinear, ie, U-shaped. Rates of rapid ejaculation were highest in the youngest (15.7%) and the oldest (12.5%) age groups. Older age (odds ratios [OR], 6.2-10.3), overweight (OR, 3.3-4.2), alcohol (OR, 0.3-0.4), intense physical activity (OR, 0.3), traditional attitudes about sexuality (OR, 2.8), and discussing sex with one's partner (OR, 0.1-0.3) were associated with erectile difficulties. Education (OR, 0.1-0.3), being overweight (OR, 22.0) or obese (OR, 20.1), alcohol consumption (OR, 0.2-0.3), stress and anxiety (OR, 10.8-12.5), holding traditional attitudes (OR, 2.8) and moderate physical activity (OR, 0.1) were factors associated with rapid ejaculation.

Conclusion The prevalence of erectile difficulties was higher than the prevalence of rapid ejaculation in men in Croatia. The odds of having these sexual difficulties increased with older age, overweight, traditional attitudes toward sex, and higher level of stress and anxiety.

A growing number of international studies on sexual health issues suggest that many women and men worldwide have sexual health problems (1-4). According to surveys based on community samples, the prevalence of male sex disturbances ranges between 10% and 50% (2,4). The most frequent male sexual disturbance seems to be premature or rapid ejaculation (5,6), reported to range from 4% to 29% (6). The Global Study of Sexual Attitudes and Behaviors estimated the prevalence of rapid ejaculation at approximately 30% across all age groups (7). Actually, it seems to be the most common of all male sexual disturbances (5-9). However, when objective definition of rapid ejaculation is attempted, problems arise (9,10). According to the fourth edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), rapid ejaculation is a persistent or recurrent onset of orgasm and ejaculation with minimal sexual stimulation before, upon, or shortly after penetration and before the person wishes it (11). It results in pronounced distress or interpersonal difficulties and is not exclusively due to the direct effects of a substance used (11). Although useful for clinical practice, this definition does not offer precise guidelines for epidemiological research. As indicated by large discrepancies in the prevalence rates (6), epidemiological analyses of rapid ejaculation are characterized by definition and measurement inconsistencies (1,10,12).

In spite of the lack of agreement as to what constitutes rapid ejaculation (12) and the fact that it is not a well-understood problem (5,13), the consequences are well known. Chronic rapid ejaculation is accompanied by an array of psychological problems, including a psychogenic erectile dysfunction (14). Rapid ejaculation can seriously burden interpersonal dynamics and decrease sexual satisfaction (15) and sometimes the overall quality of intimate relationship (16,17). In addition to frustrations, withdrawal (including the lack of desire and cessation of sexual contacts), and strained relationship, rapid ejaculation causes changes in self-image and one's sense of masculinity. It has been shown that rapid ejaculation has similar psychological impact as erectile problems, especially in terms of self-confidence and worries over the relationship, both the present and the future ones (14).

Psychologically and culturally, erectile difficulties are the most dreaded male sexual problem (16,18,19), which not only result in deep frustration, but often lead to a crisis of masculine identity (19). Recent pharmacological breakthrough has initiated a rapid growth of interest in the epidemiology of erectile difficulties. Current studies suggest that a sizeable proportion of adult men suffer from erectile difficulties and that the likelihood of erectile difficulties increases with age (1-4). According to a recently published systematic review, the prevalence of erectile difficulties ranges from 2% in men younger than 40 years to over 80% in men aged 80 years or more (4). Due to the aging of population, the number of men with erectile difficulties is expected to be rising (20,21). The projection based on the results of the Massachusetts Male Aging Study (MMAS) from 1995 is that the number of men with the condition will more than double by 2025 (22).

How do we explain considerable variations in reported prevalence rates of erectile difficulties? Methodological and conceptual differences between the studies (1,3,4,23) seem to be the main reason, although the effect of culture-specific perception of sexual problems should not be underestimated (24). In spite of a large number of population or community sample studies (18,20,25-38), inconsistent definitions and operationalization seriously hamper the analysis of the role of culture in perception and reporting of erectile difficulties in men.

In transitional countries, sexual health is a rather neglected research area. The main reason for that is the lack of education and research training of possible investigators in the field of sexology. In Croatia, sexual health issues have only recently gained attention as a topic worthy

Table 1. General characteristics of a representative sample of men aged ≥35 years in Croatia

Characteristic	No. (%) of respondents
Age group (y):	
35-39	135 (15.4)
40-49	248 (28.4)
50-59	189 (21.6)
60-69	190 (21.7)
≥70	112 (12.8)
total*	874 (100.0)
Marital status:	
married	718 (80.9)
single	53 (6.0)
divorced	52 (5.9)
widowed	65 (7.3)
total	888 (100.0)
Educational level:	
college and university (higher)	180 (20.3)
secondary	449 (50.6)
elementary	259 (29.2)
total	888 (100.0)
Residence:	
small towns (≤1999 population)	286 (32.2)
towns (2000-39 999 population)	418 (47.1)
cities (≥40 000 population)	184 (20.7)
total	888 (100)
Employment status:	
employed	406 (46.1)
unemployed	118 (13.4)
retired	357 (40.5)
total†	888 (100.0)
Sexually active in the previous month:	
yes	669 (75.3)
no	219 (24.7)
total	888 (100.0)

*Missing data for 14 (1.6%) men.
†Missing data for 7 (0.8%) men.

of clinical (39) and non-clinical research (40,41). Our aim was to determine the prevalence of and risk factors for erectile difficulties and rapid ejaculation in a national sample of Croatian men.

Participants and methods

Sampling procedure

Target population was male citizens of Croatia aged ≥35 years living in private households. According to 2001 Croatian census, the total population size of men of the given age was 1 128 837.

We performed a four-stage, two-way stratified random sampling for 21 Croatian counties and size of the settlements in terms of the number of male citizens living in private households. Six strata of settlement size were defined as follows: <499 men, 500 to 1 999, 2 000 to 9 999, 10 000 to 39 999, 40 000 to 99 999, and 100 000 men and more. Allocation of sampling points was proportional to stratum sizes. In the first stage, we chose settlements as the primary sampling points with a probability for men to be chosen proportionate to the size of the settlement. In the second stage, we performed systematic sampling of 178 starting sampling points within the each settlement, using the alphabetical list of all streets and systematically sampling all street numbers (addresses). In the third stage, households were chosen by a random walk from the starting points. In the settlements of up to 4 000 inhabitants, a random walk was done with no dispersion. In the settlements of more than 4 000 inhabitants, a random walk included "jump" of six households. In the fourth stage, the last birthday method was used to choose a respondent within a household with more eligible respondents. Additional quota control was applied to control for the total number of respondents younger and older than 55. Only one respondent was approached in each household.

Sample size

Under the assumption of erectile difficulties prevalence of 30% (39) in the total population size of 1 128 837 men aged ≥35 years, the needed sample size was 896 respondents. The expected power of statistical test for the main result of erectile difficulties was calculated to be 0.85. Desired level of precision was set to ±3%, and the level of significance to 0.05.

Respondents

A total of 1401 eligible respondents was contacted. Of them, 92 were not at home at the time of visit (twice), 78 were not interviewed because the age quota was already reached for that particular starting point, 279 refused to be interviewed, and the additional 64 started, but did not finish the interview (40 refused to answer sexuality related questions). The remaining 888 men aged ≥35 years completed the structured interview.

Population of men in Croatia, respondents, and non-respondents were of comparable age.

With respect to age, marital status, and regional distribution of the population, our sample was representative of Croatian population (Table 1). College and university educated respondents were overrepresented in our sample (20% vs 13% in the population). Residents of small settlements were underrepresented (32% vs 48% in the population), whereas men from larger settlements were overrepresented (47% and 21% of men living in towns and cities, respectively, vs 28% and 24% in the population). Response rate was lower in smaller settlements than in urban centers and in the rural, continental part of the Split region.

Three-quarters of respondents (n = 669) reported being coitally active in the month preceding the study. Those who did not have sex during the period were omitted from the analyses. Out of 669 respondents, 615 gave the valid answers to the questions on erectile dysfunction, and 601 gave valid answers to the questions on rapid ejaculation. Total item non-response was 8% for questions on erectile dysfunction (54 out of 669 respondents who had been coitally active in the month preceding the study) and 10% (68 out of 669) for questions on rapid ejaculation.

Data collection

Structured face-to-face interviews were conducted in June and July 2004 by 63 trained interviewers of whom 63% were women and 18% were medical students or medical school graduates. Data collected by male and female interviewers were compared because of the possible influence of the sex of the interviewer on the respondent's readiness to provide true and complete answers. Prevalence of reported erectile difficulties did not significantly differ among respondents interviewed by female and male interviewers (13.1% vs 11.7%, respectively, $P = 0.700$). However, respondents seemed to be less reluctant to talk about rapid ejaculation with male than with female interviewers (16.1% vs 5.0%, respectively, $P<0.001$). Approximately 20% of all respondents were contacted after the interview to verify that they were interviewed; the duration and the date of interviews were also checked. In 14 cases where serious deviations from the sampling or interviewing plan were noticed, the interviews were repeated. The possible explanation of not obtaining the answers to key items on erectile dysfunction and rapid ejaculation could be the respondents' discomfort to talk about these issues.

Questionnaire

The questionnaire consisted of 19 items assessing different aspects of general health, 7 items measuring health consciousness, 17 stress- and anxiety-related items, and 8 items to collect sociodemographic data. At the end of the questionnaire, 20 variables related to sexual functioning, sexual partners, attitudes toward sexuality, and respondent's sexual satisfaction were included. The questionnaire, created by the authors, was designed for a commercial study on age, health, and sexual functioning, and was not previously validated.

To assess prevalence of erectile difficulties we used two indicators, the erection achievement ("When you attempted sexual intercourse during the last month, how often were you able to penetrate your partner?") and the erection maintenance indicator ("During sexual intercourse within the last month, how often were you able to maintain your erection after you had penetrated your partner?") The answers to both questions were recorded on a 4-item scale, from "never" to "often." All respondents who answered "never" or "rarely" on one or both questions were classified as having erectile difficulties. The respondents who answered that they managed to achieve and/or maintain erections "half of the time" they attempted intercourse in the last month were classified as being at risk of erectile difficulties.

For assessing rapid ejaculation, a single indicator was used. Since the measurement of ejaculatory latency (the length of time between penetration and ejaculation) forms the basis of current clinical studies on rapid ejaculation (12) and is the most commonly used measure (10), we asked respondents the following question: "After you penetrated your partner, how often it happened that you ejaculated in less than 2 minutes?" A 2-minute latency period was chosen because it is currently the most frequently used cutoff (6,10). Respondents could choose one of the four answers: "never," "rarely," "half of the times," and "often." The respondents who reported that they often ejaculate in less than 2 minutes were classified as having rapid ejaculation. Those who reported rapid ejaculation half of the times were considered at risk of rapid ejaculation.

Body mass index (BMI) was calculated as weight (kg) divided by squared height (m). Men were categorized as underweight or normal (BMI ≤25), overweight (BMI <25 to ≤30), or obese (BMI >30).

The level of stress and anxiety was operationalized through an average score on five indicators, all highly loaded on the same factor. Five items inquired about nervousness and irritation; perception of control over one's life; feeling under stress; and arguments with other adult members of the family. The aggregated index of stress and anxiety had moderate reliability ($\alpha = 0.69$). An index of physical activity was determined on the basis of frequency of intense physical activity and walking for at least 20 minutes. Respondents who answered "up to once a week" on both questions were classified as having low physical activity. Those who answered "once a week or less" to the question about intense physical activity and "more often" to the question about walking were classified as having moderate physical activity. Respondents who replied "more often" to intense physical activity question and "once a week or less" to the question about walking were classified as having high physical activity. Finally, those who answered "more often" to both questions were classified as being intensely physically active. To determine the presence of chronic illness, the respondents were asked if they took any medications to treat a chronic illness. Responses to questions about alcohol intake and smoking were recorded on a 7-item scale (1 = "never" to 7 = "several times a day"). Traditional moral attitudes regarding sexuality were measured as average score on two highly correlated ($r = 0.51$; $P<0.001$) variables: "One should avoid premarital sexual activities" and "Regarding sexuality, religion is the best moral guide." As an indicator of the quality of relationship, we used the question about the frequency of discussing sexual issues with a partner during the last 12 months. Responses were recorded on a 4-item scale ranging from "never" to "often."

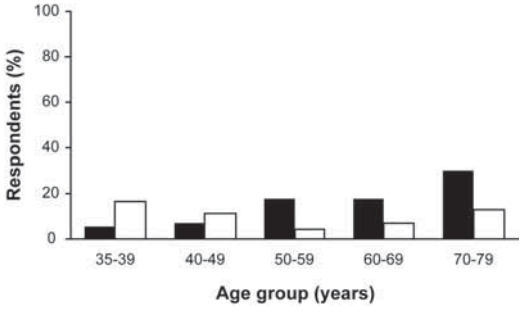

Figure 1. Prevalence of erectile dysfunction and rapid ejaculation in men by age. Closed bars – erectile dysfunction (n=77); open bars – rapid ejaculation (n=57).

Statistical analysis

Reliability analysis and principal component analysis were used to establish the level of internal consistency of various instruments, and to construct reliable one-dimensional indicators. We applied χ^2 test to assess the differences in the prevalence of erectile difficulties and rapid ejaculation in different age groups. In multivariate analyses, we used sociodemographic indicators (age, education, and income), alcohol abuse, traditional morality, and relationship indicators. Logistic regression analysis was used to produce unadjusted and adjusted odds ratios (OR) with 95% confidence intervals (95% CI), which in-

dicated the likelihood of having erectile difficulties or rapid ejaculation for men with certain characteristics relative to the reference group (no erectile difficulties or rapid ejaculation). Adjusted odds procedure (multiple logistic regression) controlled for the effect of other characteristics. All statistical analyses were performed with SPSS 11.0 (SPSS Inc., Chicago, IL, USA) statistical software package. P value of <0.05 was considered statistically significant.

Results

One-fifth of interviewed men (130 out of 615 respondents who had been sexually active the month before the interview and gave valid answers to the questions on erectile dysfunction and rapid ejaculation) experienced impaired sexual functioning in the month preceding the study. Erectile difficulties were reported by 12.5% (77 out of 615 respondents who had been

Table 2. Prevalence of rapid ejaculation in a representative sample of men aged ≥35 years in Croatia*

	No. (%) of men		OR (95% CI)	
Characteristic	with rapid ejaculation (n = 57)	total (n = 601)	unadjusted	adjusted†
Age group (y):				
≤39	19 (15.7)	121	1	1
40-49	21 (10.9)	193	0.7 (0.3-1.3)	1.4 (0.5-3.5)
50-59	5 (3.6)	139	0.2 (0.1-0.6)	0.5 (0.1-1.9)
60-69	7 (6.9)	102	0.4 (0.2-1.0)	1.5 (0.4-5.7)
70-79	5 (12.5)	40	0.8 (0.3-2.2)	2.7 (0.5-14.1)
Education:				
elementary	31 (20.7)	150	1	1
secondary	11 (3.5)	318	0.1 (0.1-0.3)	0.1 (0.0-0.3)
higher	15 (11.3)	133	0.5 (0.3-1.0)	0.3 (0.1-0.9)
BMI:				
≤25	1 (0.7)	148	1	1
<25-≤30	32 (12.5)	255	21.1 (2.9-156.1)	22.0 (2.5-190.0)
>30	24 (12.2)	197	2.4 (2.7-152.6)	20.1 (2.2-184.7)
Income (HRK):				
<1000	8 (9.0)	89	1	
1000-3000	13 (9.0)	145	1.0 (0.4-2.5)	
3001-4500	8 (6.1)	131	0.7 (0.2-1.8)	
>4500	28 (12.2)	230	1.4 (0.6-3.2)	
Alcohol:				
once a month or less	34 (19.2)	177	1	1
once a week or less	9 (7.8)	115	0.4 (0.2-0.8)	0.3 (0.1-0.8)
several times per week	7 (5.6)	124	0.3 (0.1-0.6)	0.5 (0.2-1.4)
every day	7 (3.8)	185	0.2 (0.1-0.4)	0.2 (0.1-0.6)
Smoking:				
no	40 (12.0)	333	1	1
yes	17 (6.6)	257	0.5 (0.3-0.9)	0.9 (0.5-2.3)
Medication:				
no	30 (8.3)	362	1	
yes	27 (11.3)	238	1.4 (0.8-2.5)	
Talking about sex with a partner:				
never	8 (16.7)	48	1	1
rarely	5 (4.2)	119	0.2 (0.1-0.7)	0.1 (0.0-0.4)
sometimes	15 (7.1)	211	0.4 (0.2-1.0)	0.3 (0.1-1.2)
often	29 (13.2)	220	0.8 (0.3-1.8)	0.4 (0.1-1.4)
Traditional sex attitudes:				
no	23 (5.8)	399	1	1
yes	33 (16.6)	199	3.3 (1.9-5.7)	2.8 (1.3-5.9)
Physical activity:				
low	13 (12.4)	105	1	1
moderate	4 (2.2)	182	0.2 (0.1-0.5)	0.1 (0.0-0.4)
high	10 (13.2)	76	1.1 (0.4-2.6)	1.0 (0.3-3.4)
intense	30 (12.6)	238	1.0 (0.5-2.1)	0.5 (0.2-1.5)
Stress and anxiety:				
low	2 (1.5)	130	1	1
moderate	41 (11.3)	364	8.1 (1.9-34.1)	10.8 (1.4-86.7)
high	14 (14.0)	100	1.4 (2.3-47.0)	12.5 (1.4-115.9)

*Abbreviations: OR – odds ratio; CI – confidence interval; BMI – body mass index; HRK – Croatian Kuna (€1 = HRK7.4).

†Independent variables that were insignificantly associated with the dependent variable at the level of univariate logistic analysis (unadjusted OR) were omitted from the multivariate logistic analysis (adjusted OR).

Table 3. Prevalence of erectile difficulties in a representative sample of men aged ≥35 years in Croatia*

Characteristic	No. (%) of men		OR (95% CI)	
	with erectile dysfunction (n = 77)	total (n = 615)	unadjusted	adjusted†
Age group (y):				
≤39	7 (5.8)	120	1	1
40-49	14 (7.0)	201	1.2 (0.5-3.1)	3.0 (0.6-14.7)
50-59	25 (17.7)	141	3.5 (1.5-8.4)	6.2 (1.3-29.4)
60-69	19 (17.8)	107	3.5 (1.4-8.7)	6.3 (1.3-30.6)
70-79	12 (30.0)	40	6.9 (2.5-19.2)	10.3 (1.8-60.0)
Education:				
elementary	16 (10.2)	157	1	
secondary	39 (12.1)	322	1.2 (0.7-2.3)	
higher	22 (16.2)	136	1.7 (0.9-3.4)	
BMI:				
≤25	10 (6.5)	155	1	1
<25-≤30	42 (16.0)	262	2.8 (1.4-5.7)	3.3 (1.1-10.0)
>30	25 (12.7)	197	2.1 (1.0-4.5)	4.2 (1.3-13.6)
Income (HRK):				
<1000	11 (12.5)	88	1	
1000-3000	30 (19.5)	154	1.7 (0.8-3.6)	
3001-4500	13 (9.6)	136	0.7 (0.3-1.7)	
>4500	21 (9.1)	231	0.7 (0.3-1.5)	
Alcohol:				
once a month or less	33 (17.7)	186	1	1
once a week or less	12 (9.9)	121	0.5 (0.3-1.0)	0.3 (0.1-1.0)
several times a week	13 (10.4)	125	0.5 (0.3-1.1)	0.4 (0.2-1.0)
every day	19 (10.4)	183	0.5 (0.3-1.0)	0.6 (0.4-1.3)
Smoking:				
no	50 (14.6)	342	1	
yes	27 (10.3)	262	0.7 (0.4-1.1)	
Medication:				
no	28 (7.5)	372	1	1
yes	49 (20.2)	242	3.1 (1.9-5.1)	1.6 (0.8-3.1)
Talking about sex with a partner:				
never	19 (35.2)	54	1	1
rarely	21 (17.4)	121	0.4 (0.2-0.8)	0.3 (0.1-0.8)
sometimes	19 (8.7)	219	0.2 (0.1-0.4)	0.2 (0.1-0.6)
often	16 (7.3)	218	0.2 (0.1-0.3)	0.1 (0.0-0.3)
Traditional sex attitudes:				
no	38 (9.5)	402	1	1
yes	39 (18.6)	210	2.2 (1.4-3.5)	2.8 (1.5-5.3)
Physical activity:				
low	18 (16.7)	108	1	1
moderate	31 (16.1)	192	1.0 (0.5-1.8)	1.0 (0.5-2.3)
high	11 (14.5)	76	0.9 (0.4-1.9)	0.8 (0.3-2.2)
intense	17 (7.1)	239	0.4 (0.2-0.8)	0.3 (0.1-0.8)
Stress and anxiety:				
low	11 (8.1)	135	1	1
moderate	41 (10.9)	375	1.4 (0.7-2.8)	1.4 (0.6-3.3)
high	20 (20.4)	98	2.9 (1.3-6.4)	2.1 (0.7-6.0)

*Abbreviations: OR – odds ratio; CI – confidence interval; BMI – body mass index; HRK – Croatian Kuna (€1 = HRK7.4).
†Independent variables that were insignificantly associated with the dependent variable at the level of univariate logistic analysis (unadjusted OR) were omitted from the multivariate logistic analysis (adjusted OR).

sexually active the month before and gave valid answers to the questions on erectile dysfunction) and rapid ejaculation by 9.5% (57 out of 601 who had been sexually active the month before and gave the valid answers to the questions on rapid ejaculation). Additional 26.8% (165 out of 615) and 26.3% (158 out of 601) were classified as being at risk for erectile difficulties and rapid ejaculation, respectively.

The prevalence of reported erectile difficulties increased with respondents' age (Fig. 1). Rapid ejaculation was most prevalent in the youngest (35-39 years) and the oldest age group (70-79 years). However, the association between age and rapid ejaculation did not reach the level of statistical significance when controlled for other variables (Table 2).

Independent effects of sociodemographic, attitudinal, and relationship variables on erectile difficulties and rapid ejaculation were assessed with two multiple logistic regression analyses (Tables 2 and 3). Odds of having erectile difficul-

ties were significantly influenced by age, weight, alcohol intake, physical activity, sex attitudes, and discussing sex with a partner (Table 3). The odds of having erectile difficulties were over 10 times greater among the respondents in the 70-79 age group then among those in the 35-39 age group (adjusted OR, 10.3; 95% CI, 1.8-60.0). Obese men were over 4 times more likely to have erectile difficulties than men with normal BMI (adjusted OR, 4.2; 95% CI, 1.3-13.6). While advanced age, obesity, and holding traditional sex attitudes increased the likelihood of having erectile difficulties, intense exercise, moderate alcohol intake, and the quality of relationship acted as preventive factors. Taking medications for chronic illness and stress were found significant in univariate analysis (unadjusted OR, 3.1; 95% CI, 1.9-5.1), but their influence was not confirmed in the multivariate analysis (Table 3).

Higher education level, moderate physical activity, and alcohol intake decreased the odds of having rapid ejaculation, whereas overweight or obesity, anxiousness and stress, and traditional attitudes toward sex increased it (Table 2). For example, the odds of having rapid ejaculation were 22 times higher among overweight men than among men with normal BMI (adjusted OR, 22.0; 95% CI, 2.5-190.0). Age and smoking were significantly associated with rapid ejaculation only in univariate analysis (Table 2).

The combined rate of erectile difficulties (men with erectile difficulties + men at risk for erectile difficulties) was 39.3% and the combined rate of rapid ejaculation was 35.8%. As expected, respondents with erectile difficulties and rapid ejaculation reported significantly lower sexual satisfaction than men with no difficulties (erectile difficulties: $\chi^2_4 = 26.47$, $P<0.001$; rapid ejaculation: $\chi^2_4 = 24.50$, $P<0.001$). However, we found that decreased satisfaction was not the norm. Among men with erectile difficulties, 49% stated that they were "rather satisfied" with their sex life, while 3% said that they were "very satisfied". Similarly, 61% of respondents with rapid ejaculation were "rather satisfied" and additional 16% "very satisfied" with their sex life.

Discussion

We found that a sizeable proportion of men aged ≥35 years experienced impaired sexual functioning, with erectile difficulties being more prevalent than rapid ejaculation. The prevalence of erectile difficulties was age-related, which is in accordance with other studies (1,3,4,18,20,27,35), whereas rapid ejaculation was nonlinearly associated with age, showing increased vulnerability of men under 40 and over 70 years of age. Our finding that rapid ejaculation was least prevalent in the 50-59 age group corroborates the results of a recent US study (42) and is consistent with complex and often differential psychophysiological etiology of rapid ejaculation (8,13).

There is a wide range of psychological (5,43), relationship (16,19) and biomedical factors (2,31,44,45) that influence sexual function in men. In the present study, we found that age, above normal weight, intense physical activity, moderate alcohol consumption, traditional sex attitudes, and discussing sex with a partner were independently associated with erectile difficulties. While the effects of being overweight or obese (18,46) and exercising (24,34,46,47) are straightforward, the effect of holding traditional sex attitudes is less clear. It could be that traditional attitudes contribute to unrealistic expectations, ignorance about sexual physiology, and poor erotic competence (48). They may also strengthen the unwillingness to discuss sexual difficulties and seek help early. Similarly unclear is the finding that discussing sex issues with one's partner is an important element in maintaining sexual health. The same association was reported in a recent UK study (49). Possibly, communication about sex decreases the pressure to perform and helps a man to create expectations that are more realistic. This may result in a lower likelihood of psychogenic erectile difficulties.

We were not able to confirm the preventive effect of education on erectile difficulties, which was reported in a number of studies (2,24,47). The significant association was found only with rapid ejaculation. Also, the effects of medication for chronic illness (25,37,44), alcohol abuse (24,37) and smoking (18,24,25,29,37,50) on erectile difficulties were confirmed at the univariate level only. Although no consistent profile of men with rapid ejaculation was found (8), our analysis showed that education, moderate physical activity, alcohol, traditional attitudes toward sexuality, stress and anxiety, and being overweight or obese were significantly associated with rapid ejaculation. The association between overweight or obesity and rapid ejaculation has not been previously reported (51), and we can only speculate on the possible causes. There could be a common underlying (genetic) factor, or the growth of adipose tissue may increase the likelihood of hormonal change leading to both centrally and peripherally increased responsiveness to sexual stimuli (52). Finally, overweight men, being dissatisfied with their body image and having, in general, poor self-image, could be more prone to stress and anxiety, which are well-known risk factors for rapid ejaculation (8,13,31). Stress and anxiety enhance arousal and increase sympathetic dominance thus facilitating the ejaculatory reflex (13). However, the stress and anxiety could also be, at least partly, the consequences of rapid ejaculation.

Taken in small amounts, alcohol is anecdotally known to prolong sexual intercourse by decreasing performance anxiety and penile sensitivity. Our findings seem to corroborate this impression. However, one should not assume that the effect of alcohol on rapid ejaculation is independent of the frequency of its consumption. Whether or not it is the same mechanism responsible for the decreased odds of rapid ejaculation among men who drink once a week and those who drink on a daily basis remains unknown.

A significant association between traditional attitudes and rapid ejaculation could be the consequence of unrealistic expectations (8), lack of sexual experience (48), which could be responsible for poorer ejaculatory control, and some relationship problems related to traditional gender role division.

According to DSM-IV, sexual disorders should be viewed as problems only if they cause significant distress (11). Our findings suggested that, although respondents with sexual difficulties reported lower sexual satisfaction than those with no difficulties, many men with erectile difficulties and rapid ejaculation managed to retain full sexual satisfaction. Similar findings were reported in other studies (53,54). However, since five times less men with erectile difficulties than those with rapid ejaculation reported sexual satisfaction, it seems that erectile difficulties are more psychologically damaging.

Our study had several limitations. The major limitation was the bias toward more educated men, caused by a higher refusal rate among less educated individuals to participate in the study. Since education has preventive effect (2,22,24,27), the true prevalence rates of erectile difficulties and rapid ejaculation in our study could be underestimated. Another source of bias was significantly underreported rapid ejaculation rate when female interviewers were collecting data. This could explain the fact that a recent research study carried out in Zagreb, which used self-administered questionnaire, found a higher rapid ejaculation prevalence rate (13.9). Furthermore, the prevalence of these two disorders could have been underestimated because we determined it only in respondents who were sexually active. Some respondents may not have had sex in the preceding month precisely because they had erectile difficulties or rapid ejaculation (26). Although the ratio of combined rates of erectile difficulties and those of rapid ejaculation were similar to those reported elsewhere (31,33), this unexpected finding could be the consequence of

our measurement of rapid ejaculation, which did not account for a known subgroup of rapid ejaculators, men who ejaculate before insertion.

Our study was not designed to analyze the impact of psychomorbidity on sexual problems. Although psychopathology and the related iatrogenic factors often cause, and/or contribute to, sexual dysfunctions (2,5,31), our questionnaire did not include instruments measuring possible mental health disturbances because we interviewed a non-clinical sample that would yield only a miniscule number of individuals with such disturbances. The sample of men included in our study thereby allows for generalization of our findings, which may provide an empirically valid account of the prevalence and risk factors of erectile difficulties and rapid ejaculation in Croatia.

To the best of our knowledge, this is the first national study on male sexual health disturbances carried out in a transitional European country. We hope that assessing potential demand for sexual health services would assist in public recognition of the importance of sexuality issues for quality of life, be instrumental in raising the awareness among local health practitioners about the importance of sexual health for quality of life, and support the development of sexual health services in Croatia.

Acknowledgment

The survey was funded by *Belupo* pharmaceutical company and carried out by *STRATUM Healthcare* research company. The authors had a full control over the data analyzed in this study for which they received no financial support. The authors wish to thank anonymous reviewers for their comments and suggestions.

Conflict of interest: None declared.

References

1 Lewis RW, Fugl-Meyer KS, Bosch R, Fugl-Meyer AR, Laumann EO, Lizza E, et al. Epidemiology/risk factors of sexual dysfunction. J Sex Med. 2004;1:35-9.

2 Heiman JR. Sexual dysfunction: overview of prevalence, etiological factors, and treatments. J Sex Res. 2002;39:73-8. Medline:12476261

3 Simons JS, Carey MP. Prevalence of sexual dysfunctions: results from a decade of research. Arch Sex Behav. 2001;30:177-219. Medline:11329727

4 Prins J, Blanker MH, Bohnen AM, Thomas S, Bosch JL. Prevalence of erectile dysfunction: a systematic review of population-based studies. Int J Impot Res. 2002;14:422-32. Medline:12494273

5 Wincze JP, Carey MP. Sexual dysfunction: A guide for assessment and treatment. 2nd ed. New York (NY): Guilford Press; 2001.

6 Grenier G, Byers ES. The relationships among ejaculatory control, ejaculatory latency, and attempts to prolong heterosexual intercourse. Arch Sex Behav. 1997;26:27-48. Medline:9015578

7 Montorsi F. Prevalence of premature ejaculation: A global and regional perspective. J Sex Med. 2005;2 Suppl 2:96-102.

8 Metz ME, Pryor JL, Nesvacil LJ, Abuzzahab F, Koznar J. Premature ejaculation: a psychophysiological review. J Sex Marital Ther. 1997;23:3-23. Medline:9094032

9 Grenier G, Byers ES. Operationalizing premature or rapid ejaculation. J Sex Res. 2001;38:369-78.

10 Rowland DL, Cooper SE, Schneider M. Defining premature ejaculation for experimental and clinical investigations. Arch Sex Behav. 2001;30:235-53. Medline:11330115

11 American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed. Washington (DC): American Psychiatric Association; 1994.

12 McMahon CG, Abdo C, Incrocci L, Perelman M, Rowland D, Waldinger M, et al. Disorders of orgasm and ejaculation in men. J Sex Med. 2004;1:58-65.

13 Rowland DL, Slob SK. Premature ejaculation: psychophysiological considerations in theory, research, and treatment. Annu Rev Sex Res. 1997;8:224-54. Medline:10051895

14 Symonds T, Roblin D, Hart K, Althof S. How does premature ejaculation impact a man's life? J Sex Marital Ther. 2003; 29:361-70. Medline:14504007

15 Byers ES, Grenier G. Premature or rapid ejaculation: heterosexual couples' perceptions of men's ejaculatory behavior. Arch Sex Behav. 2003;32:261-70. Medline:12807298

16 Zilbergeld B. The new male sexuality. Rev. ed. New York (NY): Bantam; 1999.

17 Rowland D, Perelman M, Althof S, Barada J, McCullough A, Bull S, et al. Self-reported premature ejaculation and aspects of sexual functioning and satisfaction. J Sex Med. 2004;1:225-32.

18 Blanker MH, Bohnen AM, Groeneveld FP, Bernsen RM, Prins A, Thomas S, et al. Correlates for erectile and ejaculatory dysfunction in older Dutch men: a community-based study. J Am Geriatr Soc. 2001;49:436-42. Medline:11347788

19 Tiefer L. In pursuit of the perfect penis. In: Kimmel M, Messner M, editors. Men's lives. New York (NY): McMillan; 1992. p. 450-65.

20 Feldman HA, Goldstein I, Hatzichristou DG, Krane RJ, McKinlay JB. Impotence and its medical and psychosocial correlates: results of the Massachusetts Male Aging Study. J Urol. 1994;151:54-61. Medline:8254833

21 McKinlay JB. The worldwide prevalence and epidemiology of erectile dysfunction. Int J Impot Res. 2000;12 Suppl 4:S6-S11. Medline:11035380

22 Ayta IA, McKinlay JB, Krane RJ. The likely worldwide increase in erectile dysfunction between 1995 and 2025 and some possible policy consequences. BJU Int. 1999;84:50-6. Medline:10444124

23 Stulhofer A. Problems of erectile dysfunction prevalence [in Croatian]. Acta Med Croatica. 2004;58:401-6. Medline:15756807

24 Nicolosi A, Moreira ED Jr, Shirai M, Bin Mohd Tambi MI, Glasser DB. Epidemiology of erectile dysfunction in four countries: cross-national study of the prevalence and correlates of erectile dysfunction. Urology. 2003;61:201-7. Medline:12559296

25 Safarinejad MR. Prevalence and risk factors for erectile dysfunction in a population-based study in Iran. Int J Impot Res. 2003;15:246-52. Medline:12934051

26 Koskimaki J, Hakama M, Huhtala H, Tammela TL. Effect of erectile dysfunction on frequency of intercourse: a population based prevalence study in Finland. J Urol. 2000;164:367-70. Medline:10893587

27 Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the United States. JAMA. 1999;281:537-44. Medline:10022110

28 Fugl-Meyer AR, Fugl-Meyer SK. Sexual disabilities, problems and satisfaction in 18-74 year old Swedes. Scandinavian Journal of Sexology. 1999;2:79-105.

29 Parazzini F, Menchini Fabris F, Bartolotti A, Calabro A, Chatenoud L, Colli E, et al. Frequency and determinants of erectile dysfunction in Italy. Eur Urol. 2000;37:43-9. Medline:10671784

30 Marumo K, Nakashima J, Murai M. Age-related prevalence of erectile dysfunction in Japan: assessment by the international index of erectile function. Int J Urol. 2001;8:53-9. Medline:11240826

31 Dunn KM, Croft PR, Hackett GI. Association of sexual problems with social, psychological, and physical problems in men and women: a cross sectional population survey. J Epidemiol Community Health. 1999;53:144-8. Medline:10396490

32 Mercer CH, Fenton KA, Johnson AM, Wellings K, Macdowall W, Mcmanus S, et al. Sexual function problems and help seeking behaviour in Britain: national probability sample survey. BMJ. 2003;327:426-7. Medline:12933730

33 Ventegodt S. Sex and the quality of life in Denmark. Arch Sex Behav. 1998;27:295-307. Medline:9604118

34 Mak R, Backer GD, Kornitzer M, de Meyer JM. Prevalence and correlates of erectile dysfunction in a population-based study in Belgium. Eur Urol. 2002;41:132-9. Medline:12074399

35 Akkus E, Kadioglu A, Esen A, Doran S, Ergen A, Anafarta K, et al. Prevalence and correlates of erectile dysfunction in Turkey: a population-based study. Eur Urol. 2002;41:298-304. Medline:12180232

36 Moreira ED, Abdo CH, Torres EB, Lobo CF, Fittipaldi JA. Prevalence and correlates of erectile dysfunction: results of the Brazilian study of sexual behavior. Urology. 2001;58:583-8. Medline:11597544

37 Martin-Morales A, Sanchez-Cruz JJ, Saenz de Tejada I, Rodrigues-Vela L, Fernando Jimenez-Cruz J, Burgos-Rodriguez R. Prevalence and independent risk factors for erectile dysfunction in Spain: results of the epidemiologia de la disfuncion erectile masculina study. J Urol. 2001;166:569-76. Medline:11458070

38 Giuliano F, Chevret-Measson M, Tsatsaris A, Reitz C, Murino M, Thonneau P. Prevalence of erectile dysfunction in France: results of an epidemiological survey of a representative sample of 1004 men. Eur Urol. 2002;42:382-9. Medline:12361905

39 Bukovic D, Fajdic J, Strinic T, Habek M, Hojsak I, Radakovic N. Differences in sexual functioning between patients with benign and malignant breast tumors. Coll Antropol. 2004;28 Suppl 2:191-201. Medline:15571093

40 Stulhofer A, Gregurovic M, Pikic A, Galic I. Sexual problems of urban women in Croatia: Prevalence and correlates in a community study. Croat Med J. 2005;46:45-51. Medline:15726675

41 Stulhofer A, Tiljak H, Gregurovic M, Kuti S, Zelenbrz J, Landripet I. Prevalence of male sexual problems in a community sample [in Croatian]. Medicina. In press 2006.

42 Overmyer M. Rate of premature ejaculation varies by race and age. Urology Times. 2003; August Issue:10.

43 Bancroft J. Lecture 4: psychogenic erectile dysfunction–a theoretical approach. Int J Impot Res. 2000;12 Suppl 3:S46-8. Medline:11002401

44 Derby CA, Barbour MM. Hume Al, McKinlay JB. Drug Therapy and prevalence of erectile dysfunction in the Massachusetts Male Aging Study cohort. Pharmacotherapy. 2001;21:676-83. Medline:11401181

45 Bancroft J. Biological factors in human sexuality. J Sex Res. 2002;39:15-21. Medline:12476251

46 Derby CA, Mohr BA, Goldstein I, Feldman HA, Johannes CB, McKinlay JB. Modifiable risk factors and erectile dysfunction: can lifestyle changes modify risk? Urology. 2000;56:302-6. Medline:10925098

47 Aytac IA, Araujo A, Johannes C, Klimman K, McKinlay JB. Socioeconomic factors and incidence of erectile dysfunction: findings of the longitudinal Massachussetts Male Aging Study. Soc Sci Med. 2000;51:771-8. Medline:10975236

48 Stulhofer A. Gender, sex attitudes and heterosexual behavior in major Croatian cities [in Croatian]. Rev Sociol. 2000;31:63-79.

49 Mercer CH, Fenton KA, Johnson AM, Copas AJ, Macdowall W, Evans B, et al. Who reports sexual function problems? Empirical evidence from Britain's 2000 National Survey of Sexual Attitudes and Lifestyles. Sex Transm Infect. 2005;81:394-9. Medline:16199738

50 Tengs TO, Osgood ND. The link between smoking and impotence: two decades of evidence. Prev Med. 2001;32:447-52. Medline:11394947

51 Esposito K, Giugliano D. Obesity, the metabolic syndrome, and sexual dysfunction. Int J Impot Res. 2005;17:391-8. Medline:15902279

52 Motofei IG. A bihormonal model of normal sexual stimulation: the etiology of premature ejaculation. Med Hypotheses. 2001;57:93-5. Medline:11421633

53 Fugl-Meyer K, Fugl-Meyer AR. Sexual disabilities are not singularities. Int J Impot Res. 2002;14:487-93. Medline:12494283

54 Bancroft J, Loftus J, Scott Long J. Distress about sex: A national survey of women in heterosexual relationships. Arch Sex Behav. 2003;32:193-208. Medline:1280729