

Sexual Activity of Young Men is Not Related to Their Anthropometric Parameters

Imre Rurik, MD, PhD,*† Attila Varga, MD, PhD,‡ Ferenc Fekete, MD,§¶ Timea Ungvári, MSc,* and János Sándor, MD, PhD**

*Department of Family and Occupational Medicine, Faculty of Public Health, University of Debrecen, Debrecen, Hungary; †Unit of Urology and Andrology, Primary Care Center, Budapest, Hungary; ‡Department of Urology, Center for Andrology, Clinical Center, University of Debrecen, Debrecen, Hungary; §Hungarian Society for Sexual Medicine, Budapest, Hungary; ¶Mr. Clinic Outpatient Center, Budapest, Hungary; **Division of Biostatistics and Epidemiology, Department of Preventive Medicine, Faculty of Public Health, University of Debrecen, Debrecen, Hungary

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ABSTRACT

Introduction. Many articles have been written about the deterioration of male sexual function, mainly in relation to metabolic diseases and aging. With younger men, unless they have a complaint, sexual issues are rarely discussed during medical consultations. No articles could be found about anthropometric parameters as factors potentially influencing sexual performance.

Aim. The aim of this study was to find the anthropometric parameters with the closest correlation with sexual activity.

Main Outcome Measures. Main outcome measures included self-reported weekly intercourses, age, body weight and height, body mass index (BMI), and waist circumference.

Methods. Data for 531 heterosexual men aged 20–54 years were collected in three andrological centers. Past and recent morbidity, medications, and some lifestyle elements were recorded; anthropometric parameters were measured; and andrological examination was performed. The average weekly number of intercourses was asked confidentially.

Results. The mean weekly coital frequency (\pm SD) was 2.55 ± 1.08 . The highest self-reported weekly coital frequency was recorded for men between the ages of 25 and 29 (3.02 ± 1.27). Coital frequency was higher among men with a height of less than 175 cm (2.69 ± 1.24), weight of less than 78 kg (2.74 ± 1.18), normal BMI (2.74 ± 1.16), normal waist circumference (2.69 ± 1.19), and no metabolic disease (2.57 ± 1.11). Logistic regression described an inverse, statistically significant association between age and coital frequency, with the following odds ratios for coital frequency (OR_{cf}): $OR_{cf \geq 2} = 0.932$, $P < 0.001$; $OR_{cf \geq 2.5} = 0.935$, $P < 0.001$; $OR_{cf \geq 3} = 0.940$, $P < 0.001$; $OR_{cf \geq 3.5} = 0.965$, $P = 0.041$. Among men who reported a coital frequency of more than 3.5 times a week, waist circumference ($OR_{cf \geq 3.5} = 0.986$, $P = 0.066$) showed borderline association with lower sexual activity, while lesser height ($OR_{cf \geq 3.5} = 0.951$, $P = 0.005$) was associated with higher activity.

Conclusion. In this study's age range, none of the examined anthropometric parameters was perfectly correlated with sexual activity. Obesity and metabolic diseases can cause all types of sexual function to deteriorate in older age, whereas their effects may not yet be prominent at younger ages (below 45 years). Health promotion for all ages should focus on prevention of obesity so as to improve quality of life and sexual health. **Rurik I, Varga A, Fekete F, Ungvári T, and Sándor J. Sexual activity of young men is not related to their anthropometric parameters. J Sex Med **;**.***_**.**

Key Words. Anthropometry; Body Height; Body Weight; BMI; Coital Frequency; Hungarian; Primary Care; Sexual Activity; Young Men; Waist Circumference

Introduction

Is sex just fun? Jannini et al. asked this question in a review article and followed it with an explanation of how sexual activity improves health. In past centuries, on the basis of nonscientific, religious, or superstitious arguments, sexual activity was regarded as harmful to health. This opinion is now rejected, and intercourse is generally considered as healthy [1]. Sexually active life expectancy has been extended in both sexes and in all societies owing to increases in overall life expectancy.

There are many articles about the deterioration of sexual function among middle-aged and older men. The most frequent reasons are metabolic diseases and the process of aging itself. Obesity is considered as the main contributor among metabolic diseases and can be characterized by evaluation of anthropometric factors. Obesity in men has been associated with infertility in numerous studies; most obese men may be affected by decreased libido and erectile dysfunction [1–3]. Higher BMI is associated with greater impairment in sexual quality of life among men; however, sexual behavior differs less among women of different body mass indices [3,4]. Besides general health status, waist circumference has also been considered as a factor that affects sexual life [5]. There is scant information on people's beliefs about weight and sexuality and about sexuality of obese individuals [6–8].

There are even fewer data on how sexuality is influenced by social status and general health. Psychological conditions can also influence sexual behaviour in both genders; moreover, these factors are not easy to identify and quantify. At older ages, couples' sexual life, including sexual activity, is more influenced by the health status of both partners and their interpersonal relationship. Studies have mostly dealt with sexual dysfunctions experienced by middle-aged or older men, mainly erectile dysfunction, and there are fewer data on younger generations [6,9]. Despite important achievements in sexual medicine during previous decades, questions regarding sexual life are still mostly neglected during routine consultations in almost all medical specialties. There is no scientific definition of or consensus on average levels of sexual activity, which generally means the frequency of intercourse. In the literature available to date, only public (lay) surveys with very different questions and methods with noncomparative analysis of sexual activity of different male populations can be found [10–12].

Aims

We tried to find instances of medical consultations where the reasons for consultation were closely related to sexuality and questions related to sexual activity could be properly addressed.

The objectives of this study are to determine whether age and anthropometric parameters, such as body height, weight, body mass index (BMI), and waist circumference, are correlated with self-reported weekly coital frequency among young men (below 45 years) and to find the anthropometric parameter most closely correlated with coital frequency.

Patients and Methods

Selection of Patients

Men participating in the study were recruited in three andrological centers during the study period from November 2010 to October 2013. Family planning was the main reason for consultation.

Criteria for Inclusion and Exclusion

The only inclusion criterion was an active sexual life with a steady female partner, without any related complaints.

Besides admitted homosexuality or bisexuality, other exclusion criteria were impaired psychological health (evaluated during the consultation) and conditions affecting sexual desire or performance, including erectile dysfunction, which was diagnosed when International Index of Erectile Function-5 score was below 21 [13].

Procedure of Evaluation

Medical history, recent morbidity, and medications were recorded, with special focus on the presence of metabolic diseases (hypertension and diabetes). This was followed by physical examination of the genital organs. Semen volume and sperm number, morphology, and motility were assessed during the routine andrological examination.

Body height, weight, and waist circumference were measured, and BMI was calculated.

Among the questions related to health and lifestyle (smoking, alcohol consumption, physical activity), the average weekly number of intercourses was asked confidentially.

Categorization of Variables

Data on sexual activity were based on patients' self-reported coital frequency. Patients usually

Table 1 Anthropometric characteristics of study sample (N = 531)

	Age (years)	Height (cm)	Weight (kg)	Body mass index (kg/m ²)	Waist circumference (cm)
Mean	35.01	179.10	89.65	27.93	95.23
SD	6.11	7.06	16.54	4.78	13.61
Range	20–54	159–198	58–175	18.39–54.01	66–155

gave a range (e.g., 1–2 or 3–4). When ranges were given, their means were recorded (e.g., 1.5 or 3.5). Specific numbers were recorded at face value.

For BMI, the men were divided into four groups according to the categories established by the World Health Organization (WHO): underweight (<18.5 kg/m²), normal (18.5 kg/m²–24.9 kg/m²), overweight (25–29.9 kg/m²), and obese (over 30 kg/m²).

Data on waist circumference were classified into three categories according to the predicted cardiovascular risk of abdominal obesity: normal (<94 cm), elevated (94–102 cm), and high (>102 cm).

The study protocol was approved by the regional ethical committee (DEOEC RKEB/IKEB 3657-2012), and permission was issued by the county's chief medical officer.

The influence of anthropometric parameters and metabolic disorders on weekly number of intercourses was analyzed using multivariate logistic regression models. Dichotomized coital frequency was defined as outcome. The analyses were implemented for five threshold values of coital frequency (2, 2.5, 3, 3.5, and 4 intercourses a week). The statistical tests for the odds ratio of coital frequency (OR_{cf}) were considered significant at $P < 0.01$, taking into consideration the multiple hypothesis testing. Stata 10.1 (StataCorp LP, College Station, TX, USA) was used to analyze statistical data.

Results

Data for 531 men (from 20 to 54 years of age) were analyzed. The main anthropometric characteristics of the study population are presented in Table 1.

Table 2 shows the mean reported weekly number of intercourses by anthropometric parameters, age, and presence or absence of cardiometabolic disorders within the study population. The highest levels of coital activity were reported by men 25–29 years of age (3.02 ± 1.27), those shorter than 175 cm (2.69 ± 1.24), those

weighing less than 78 kg (2.74 ± 1.18), those with normal BMI (2.74 ± 1.16), those with normal waist circumference (2.69 ± 1.19), and those without cardiometabolic disease (2.57 ± 1.11).

The mean coitus frequency per week was 2.55 ± 1.08 , with a range of 0.2 to 7.5. According to the Kolmogorov–Smirnov test ($Z = 2.993$, $P < 0.001$), the distribution deviated significantly from normal; therefore, coitus frequency was dichotomized using cutoffs of 2, 2.5, 3, 3.5, and 4 intercourses a week, and its determinants were investigated by logistic regression analysis. Figures 1–5 show the distribution of coital frequency with regard to the different anthropometric parameters.

Table 2 Weekly number of intercourses by anthropometric characteristics and presence of metabolic disorders

		Weekly number of intercourses, mean (SD)	Patients, n (%)
Age (years)*	20–24	2.74 ± 1.19	17 (3.2)
	25–29	3.02 ± 1.27	63 (11.9)
	30–34	2.68 ± 0.98	174 (32.8)
	35–39	2.30 ± 0.95	153 (28.8)
	40–44	2.38 ± 1.05	75 (14.1)
	45–49	2.81 ± 1.43	27 (5.1)
	50–54	1.22 ± 0.81	11 (2.1)
Height (cm)†	159–174	2.69 ± 1.24	132 (24.8)
	175–177	2.32 ± 0.95	85 (16.0)
	178–182	2.51 ± 0.97	163 (30.7)
	183–198	2.59 ± 1.11	151 (28.4)
Weight (kg)†	58–77	2.74 ± 1.18	130 (24.5)
	78–87	2.51 ± 1.22	129 (24.3)
	88–99	2.45 ± 0.95	138 (25.9)
	100–175	2.49 ± 0.97	133 (25.0)
Body mass index‡	Underweight	2.50 ± 0.00	2 (0.4)
	Normal	2.74 ± 1.16	148 (27.9)
	Overweight	2.45 ± 1.07	234 (44.1)
	Obese	2.50 ± 1.01	146 (27.5)
Waist circumference‡	Normal	2.69 ± 1.19	270 (50.8)
	Elevated	2.28 ± 0.84	91 (17.1)
	High	2.46 ± 1.00	167 (31.5)
Cardiometabolic disorders	None	2.57 ± 1.11	483 (91.3)
	Present	2.31 ± 0.79	48 (9.0)
Total		2.55 ± 1.08	531 (100.0)

*Categories divided by 5-year intervals

†Categories divided by quartile

‡Categories determined according to World Health Organization criteria

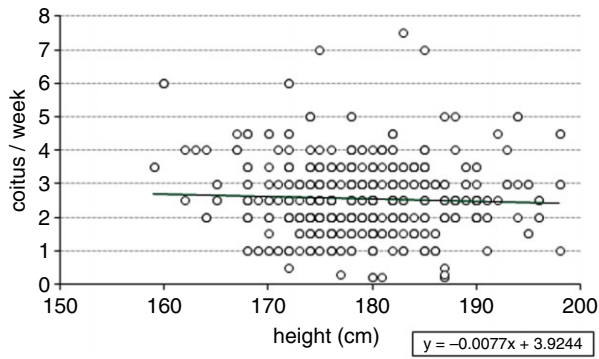


Figure 1 Distribution of weekly number of intercourses by body height.

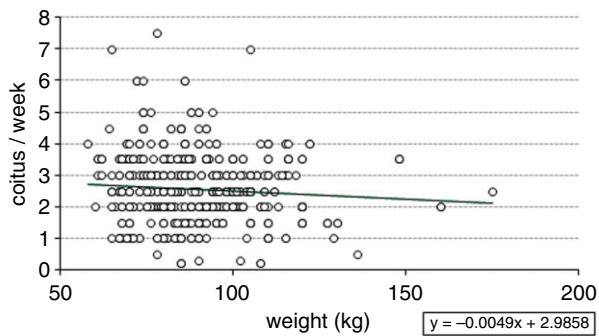


Figure 2 Distribution of weekly number of intercourses by body weight.

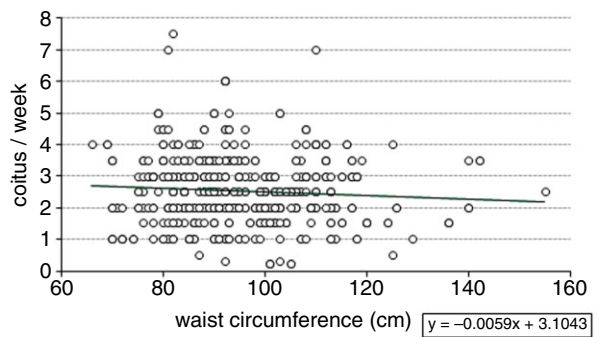


Figure 3 Distribution of weekly number of intercourses by waist circumference.

Univariate logistic regression described inverse, statistically significant associations with sexual activity for age ($OR_{cf \geq 2} = 0.932, P < 0.001$; $OR_{cf \geq 2.5} = 0.935, P < 0.001$; $OR_{cf \geq 3} = 0.940, P < 0.001$; $OR_{cf \geq 3.5} = 0.965, P = 0.041$) and body height ($OR_{cf \geq 3.5} = 0.970, P = 0.038$; $OR_{cf \geq 4} = 0.960, P = 0.041$). Waist circumference ($OR_{cf \geq 3.5} = 0.986, P = 0.066$) showed a borderline direct association with lower sexual activity. Decreases in sexual activ-

ity with increasing age ($OR_{cf \geq 2} = 0.926, P < 0.001$; $OR_{cf \geq 2.5} = 0.930, P < 0.001$; $OR_{cf \geq 3} = 0.938, P < 0.001$; $OR_{cf \geq 3.5} = 0.964, P = 0.045$) and height ($OR_{cf \geq 3.5} = 0.951, P = 0.005$) were confirmed by multivariate analysis (Table 3).

In 404 men (76% of the study population), the sperm count was above 15 million/mL. In 16 men (3%), no spermatogenic cells were found, and in 111 patients (21%), oligozoospermia was diagnosed according to the WHO threshold of a sperm count lower than the fifth percentile for fertile men [14]. Spermatological and anthropometric parameters did not show any association; therefore, they were not analyzed any further in this study.

Data for smokers did not differ from those of men who had quit smoking or never smoked. Drinking habits were not recorded or analyzed.

Discussion

Main Findings

Among the young men, no anthropometric parameters were found to be perfectly correlated

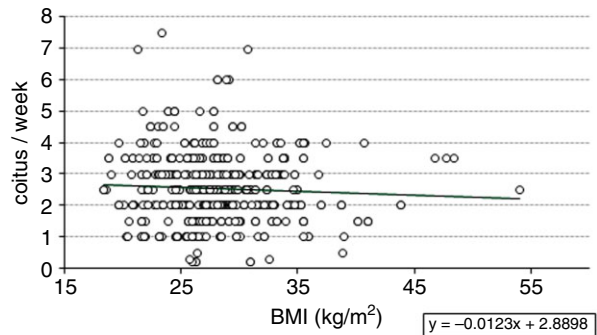


Figure 4 Distribution of weekly number of intercourses by body mass index.

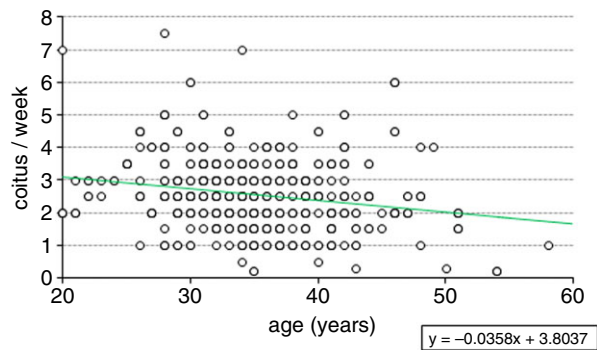


Figure 5 Distribution of weekly number of intercourses by age.

Table 3 Correlations of anthropometric characteristics and presence or absence of metabolic disorders with sexual activity by univariate and multivariate logistic regression analysis

Sexual activity							
Cutoff (weekly number of intercourses)	Patients at or above cutoff (n)	Patients below cutoff (n)	Explanatory variables	Crude OR	P	Adjusted OR	P
2	418	93	Age (years)	0.932	<0.001*	0.926	<0.001*
			Height (cm)	0.999	0.936	0.995	0.771
			Waist (cm)	0.993	0.361	1.009	0.604
			Weight (kg)	0.995	0.408	0.988	0.456
			MD (Y/N)	1.558	0.297	1.992	0.110
2.5	297	191	Age (years)	0.935	<0.001*	0.930	<0.001*
			Height (cm)	1.008	0.528	1.006	0.714
			Waist (cm)	0.996	0.500	1.018	0.232
			Weight (kg)	0.996	0.428	0.986	0.257
			MD (Y/N)	0.700	0.249	0.806	0.510
3	208	273	Age (years)	0.940	<0.001*	0.938	<0.001*
			Height (cm)	0.996	0.719	0.982	0.226
			Waist (cm)	0.989	0.103	0.988	0.400
			Weight (kg)	0.994	0.276	1.009	0.476
			MD (Y/N)	0.656	0.207	0.722	0.362
3.5	124	331	Age (years)	0.965	0.041*	0.964	0.045*
			Height (cm)	0.970	0.038*	0.951	0.005*
			Waist (cm)	0.986	0.066†	0.971	0.081
			Weight (kg)	0.991	0.147	1.024	0.113
			MD (Y/N)	0.467	0.091	0.500	0.140
4	60	390	Age (years)	0.970	0.189	0.967	0.163
			Height (cm)	0.960	0.041*	0.955	0.051†
			Waist (cm)	0.986	0.178	0.994	0.786
			Weight (kg)	0.985	0.095	1.001	0.950
			MD (Y/N)	0.335	0.137	0.383	0.203

* $P < 0.05$

†Borderline association

OR = odds ratio; MD = metabolic disease

with sexual activity. Self-reported sexual activity was strongly and inversely correlated with age, with the highest frequency reported by men between 25 and 30 years. Only among the most active men, with more than 3.5 weekly intercourses, was number of intercourses inversely correlated with body height and waist circumference. Body weight did not prove to be significantly related to coitus frequency. The presence of a metabolic disorder showed a borderline association with decreased sexual activity. The highest mean level of sexual activity was reported by men within the “normal” anthropometric ranges.

Comparison with Previous Research

No previous study could be found where self-reported sexual activity was recorded in any medical setting; only population surveys were available for comparison of data. Greater height (>74" = 181 cm), lower level of education, and younger age were predictive of increased coital frequency among men surveyed in the United States [15]. Within the examined cohort (25–45 years of age), men with the lowest BMI were the

most active, followed by the obese and overweight. Self-reported health was not predictive of sexual activity, and the reported monthly number of intercourses ranged from 4.8 to 6.8. Most of these observations were confirmed by our study, although highest activity was reported among shorter men, and activity in all age categories was even higher.

When data on coitus frequency are based on self-report, asking about weekly frequency seems most practical. People usually find it easier to remember their activities in recent weeks, and asking men to make precise recordings of intercourses in a diary seems unrealistic.

Body size and shape, characterized by anthropometric parameters like weight, height, BMI, and waist circumference, may have an effect on some domains of sexuality. Weight gain is usually a life-long process, and people who are overweight in their childhood or youth are usually candidates for obesity in middle age [16–19]. As the factor mainly responsible for obesity, the metabolic syndrome is to be considered the most important threat to male sexual health of the 21st century [20]. The propor-

tion of the population that is overweight and obese is on the rise and already includes more than 50% of the adult Western male population [21–23]. There are no available data on whether an obese man's sexual experience would be similar to that of a normal-weight man [7]. The proportion of overweight/obese men in our younger Hungarian study population was higher compared with the findings of a French survey that studied both sexes and more than one generation (72% vs. 40%) [24].

There is a lack of comparable and reliable data regarding sexual activity in the younger age cohort. Within our study population, 93% were considered as young, being below 45 years of age. Higher activity in the age group between 45 and 50 years might be explained by a new partner, although this was not examined. Epidemiological studies in older generations often report deteriorated sexual performance, mainly because of the higher prevalence of erectile dysfunction. The findings of epidemiological studies suggest that metabolic parameters, particularly waist circumference, are key predictors of low testosterone. Taking this widely accepted fact into consideration, testosterone level was rarely measured and was not analyzed in this study; it is not included in the protocol of the first stage of family planning consultations in Hungary. Hormone profile was always measured for azoospermic men, but only in the later stages of evaluation. Lower testosterone levels are common in older men [25]. The effect of late-onset hypogonadism on both sexuality and fertility can also be a factor in older patients [26]. However, it was not a factor in our cohort, in which only 20% of men were above 40 years old, with most of them considered young.

The observed prevalence of hypertension was 7.7% ($n = 41$), and that of diabetes mellitus was 1.3% ($n = 7$). According to Hungarian age-specific prevalence data, the expected prevalence rates in the study sample would have been 8.56% ($n = 38$) for hypertension and 1.41% ($n = 6$) for diabetes mellitus [27]. The relative risks (RRs) of disorders did not differ significantly from the Hungarian reference values (hypertension, $RR = 0.88$, 95% confidence interval 0.65–1.20; diabetes mellitus, $RR = 0.91$, 95% confidence interval 0.44–1.92). The basic anthropometric data for this cohort did not deviate from those from the latest national survey in Hungary [28].

There is a temporal trend for spermatological parameters to deteriorate in parallel with the increasing prevalence of obesity in the developed world [29,30]. No evidence-based treatment for

the infertility associated with male obesity has been demonstrated to date that increases the likelihood of pregnancy [2]. Our data did not show any statistical correlations between sperm count and anthropometric characteristics; therefore, these parameters were not analyzed in our study.

There have been controversial studies on the impact of fertility problems on sexuality and the frequency of intercourse [31,32]. However, these studies were conducted before the revolutionary changes in assisted reproduction. For the majority of couples in which the man has a low sperm count, assisted reproduction is recommended in our clinics as a solution or therapeutic option. Nevertheless, infertility does not preclude high levels of sexual activity. It could even be the explanation why men between 40 and 50 years old reported high activity. Even after decades of research, the connections between psychological stress (as a cause or reaction) and infertility have still not been fully explained [33]. Most men in our study were examined between 0.5 and 1.5 years after they and their partners began trying for pregnancy; this should be considered as a short period, without psychological consequences.

Limitations and Strengths

Although questions about previous smoking and drinking habits were asked during consultation, only current habits were recorded, and this information was insufficient for proper statistical comparison.

Data were derived from a cross-sectional study; differences between participants with regard to sexual practices and previous weight changes were not evaluated. Presentation of data and analysis of correlations were done mainly based on cutoff points, which were chosen according to age, by which participants were grouped using ranges of 5 years.

Although data regarding the incidence of morbidities and basic anthropometric values were representative, the study was conducted in a medical setting where patients were recruited consecutively. The population could not be considered a "healthy population," and the study did not fit all the requirements and standards for clinical trials in male sexual dysfunction [34].

No data were collected on either education or social circumstances. Data recorded on current jobs were insufficient for proper comparison.

Interpersonal relationships between partners, which have a strong impact on couples' sexual life,

were also not evaluated. It was considered that living together with a common desire for pregnancy was an adequate determinant of relationship strength.

The strength of the study is the reliability of the data, which were obtained from confidential conversation between doctor and patient. This method seems better than asking participants to fill out a web-based evaluation form or questionnaire, keep a sexual diary, or take a survey [11,12]. More studies in medical settings are needed to compare different populations.

Conclusion

Obesity and metabolic diseases can cause deterioration of male sexual function at any age, although the effects are not as prominent in younger men. Results from weight loss intervention studies are less conclusive but also point toward improvement in sexual function with reduced weight [35].

Health promotion for men of all ages should focus on prevention of obesity so as to improve quality of life and sexual health [9].

Although the importance of good sexual health is already recognized by most health professionals, sexual issues are rarely discussed with patients, especially with the younger generation. Sexual health still remains a sensitive area and usually is not properly explored. Our study may lead others to do this.

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Corresponding Author: Imre Rurik, MD, PhD, MSc, Department of Family and Occupational Medicine, University of Debrecen, Faculty of Public Health, 4032 Debrecen, Móricz Zs. krt. 22, Hungary. Tel: +36-52-25-52-52; Fax: +36-52-25-52-53; E-mail: Rurik.Imre@sph.unideb.hu; Rurik.dr@t-online.hu

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Statement of Authorship

Category 1

(a) Conception and Design

Imre Rurik; János Sándor

(b) Acquisition of Data

Imre Rurik; Attila Varga; Ferenc Fekete

(c) Analysis and Interpretation of Data

János Sándor; Timea Ungvári

Category 2

(a) Drafting the Article

Imre Rurik; Timea Ungvári; János Sándor

(b) Revising It for Intellectual Content

Imre Rurik; János Sándor

Category 3

(a) Final Approval of the Completed Article

Imre Rurik; János Sándor

References

- Jannini EA, Fisher WA, Bitzer J, McMahon CG. Is sex just fun? How sexual activity improves health. *J Sex Med* 2009;6:2640–8.
- Hammoud AO, Meikle AW, Reis LO, Gibson M, Peterson CM, Carrell DT. Obesity and male infertility: A practical approach. *Semin Reprod Med* 2012;30:486–95.
- Kolotkin RL. Construct validity of the Impact of Weight on Quality of Life questionnaire. *Obes Res* 1997;47:434–41.
- Kaneshiro B, Jensen JT, Carlson NE, Harvey SM, Nichols MD, Edelman AB. Body mass index and sexual behavior. *Obstet Gynecol* 2008;112:586–92.
- Shabsigh R, Shah M, Sand M. Erectile dysfunction and men's health: Developing a comorbidity risk calculator. *J Sex Med* 2008;5:1237–43.
- Rurik I. Sexual activity of Hungarian men. *J Sex Med* 2009;6:894–5.
- Regan PC. Sexual outcasts: The perceived impact of body weight and gender on sexuality. *J Appl Soc Psychol* 1996;26:1803–15.
- Kinzl JF, Schrattenecker M, Fiala M. [Sexuality and obesity—significance of self-esteem.] *Neuropsychiatrie* 2006;20:192–6. In German.
- Han TS, Tajar A, O'Neill TW, Jiang M, Bartfai G, Boonen S, Casanueva F, Finn JD, Forti G, Giwercman A, Huhtaniemi IT, Kula K, Pendleton N, Punab M, Silman AJ, Vanderschueren D, Lean ME, Wu FC; EMAS Group. Impaired quality of life and sexual function in overweight and obese men: The European Male Ageing Study. *Eur J Endocrinol* 2011;164:1003–11.
- Moreira ED Jr, Hartmann U, Glasser DB, Gingell C; GSSAB Investigators Group. A population survey of sexual activity, sexual dysfunction and associated help-seeking behavior in middle-aged and older adults in Germany. *Eur J Med Res* 2005;10:434–43.
- Sanders SA, Herbenick D, Reece M, Schick V, Mullinax M, Dodge B, Fortenberry JD. The development and validation of a brief Quality of Sexual Experience (QSE) scale: Results from a nationally representative sample of men and women in the United States. *J Sex Med* 2013;10:2409–17.
- Shaeer O, Shaeer KZ. The Global Online Sexuality Survey: Sexual function and dysfunction in USA. *J Reproduktionsmed Endokrinol* 2012;9:328.
- Rosen RC, Cappellen JC, Smith MD, Lipsky J, Peña M. The IIEF-5 Questionnaire (SHIM). 1999. Available at: <http://surgery.arizona.edu/sites/surgery.arizona.edu/files/pdf/SHIM%20score.pdf> (accessed November 9, 2013).
- Berényi M, Kopa ZS. [The new WHO reference values in andrology.] *Magyar Andrologia [Hungarian Andrology]* 2010;15:23–6. In Hungarian.
- Eisenberg ML, Shindel AW, Smith JF, Breyer BN, Lipshultz LI. Socioeconomic, anthropomorphic, and demographic predictors of adult sexual activity in the United States: Data from the National Survey of Family Growth. *J Sex Med* 2010;7:50–8.

- 16 Alberti KG, Zimmet P, Shaw J; IDF Epidemiology Task Force Consensus Group. The metabolic syndrome—a new worldwide definition. *Lancet* 2005;366:1059–62.
- 17 Kovács E, Jancsó Z, Móczár C, Szigethy E, Frese T, Rurik I. Life-long weight change can predict metabolic diseases. *Exp Clin Endocrinol Diabetes* 2012;12:573–8.
- 18 Iski G, Márton H, Ilyés I, Hendrik Z, Kovács E, Rurik I. The impact of overweight on the control of asthma in children. Hungarian primary care pilot study. *Sloven J Public Health* 2012;51:141–6.
- 19 Janiszewski PM, Janssen I, Ross R. Abdominal obesity and physical activity are associated with erectile dysfunction independent of body mass index. *J Sex Med* 2009;6:1990–8.
- 20 Meuleman EJH. Men's sexual health and the metabolic syndrome. *J Sex Res* 2011;48:142–8.
- 21 Andersen I, Heitman BL, Wagner G. Obesity and sexual dysfunction in younger Danish men. *J Sex Med* 2008;5:2053–60.
- 22 Szabó KJ, Ádány R, Balla J, Balogh Z, Boda Z, Édes I, Fekete I, Káplár M, Mátyus J, Oláh L, Olvasztó S, Paragh G, Páll D, Pfliegler G, Vajda G, Zeher M, Csiba L. Advances in the prevention, diagnosis and therapy of vascular diseases. *Orv Hetil* 2012;153:483–98.
- 23 Malavige LS, Wijesekara P, Seneviratne Epa D, Ranasinghe P, Levy JC. Ethnic differences in sexual dysfunction among diabetic and nondiabetic males: The Oxford Sexual Dysfunction Study. *J Sex Med* 2013;10:500–8.
- 24 Bajos N, Wellings K, Laborde C, Moreau C; CSF Group. Sexuality and obesity, a gender perspective: Results from French national random probability survey of sexual behaviours. *BMJ* 2010;340:c2573.
- 25 European Association of Urology. Guidelines on male sexual dysfunction: Erectile dysfunction and premature ejaculation. 2013. Available at: http://www.uroweb.org/gls/pdf/14_Male%20Sexual%20Dysfunction_LR.pdf (accessed November 9, 2013).
- 26 Jungwirth A, Giwercman A, Tournaye H, Diemer T, Kopa ZS, Dohle G, Krausz C; European Association of Urology Working Group on Male Infertility. European Association of Urology Guidelines on Male Infertility: The 2012 update. *Eur Urol* 2012;62:324–32.
- 27 Szigethy E, Széles G, Horváth A, Hidvégi T, Jermendy G, Paragh G, Blaskó G, Ádány R, Vokó Z. Epidemiology of the metabolic syndrome in Hungary. *Public Health* 2012;126:143–9.
- 28 National Institute for Food and Nutrition Science (Hungary). National Diet and Nutritional Status Survey. 2009. Available at: <http://www.oeti.hu/download/nationaldiet.pdf> (accessed November 9, 2013).
- 29 Mokánszki A, Ujfalusi A, Balogh E, Molnár Z, Sápy T, Jakab A, Varga A, Oláh E. [Cytogenetic and molecular genetic studies in fertility in East Hungary.] *Orv Hetil* 2013;154:52–61. In Hungarian.
- 30 Móczár C, Borgulya G, Kovács E, Rurik I. Could primary care dietary intervention combined with lifestyle changes be effective in the cardiovascular prevention? *Acta Alim* 2012;41:248–56.
- 31 Nachtigall RD, Becker G, Wozny M. The effects of gender-specific diagnosis on men's and women's response to infertility. *Fertil Steril* 1992;57:113–21.
- 32 Karahasanoglu A, Barglow P, Growe G. Psychological aspects of infertility. *J Reprod Med* 1972;241–7.
- 33 Oberpenning R, Muthny FA, Oberpenning F. Psychology of fertility disorders. In: Nieschlag E, Behre HM, Nieschlag S, eds. *Andrology*. 3rd edition. Berlin Heidelberg: Springer-Verlag; 2010:521–38.
- 34 Porst H, Vardi Y, Akkus E, Melman A, Park NC, Seftel AD, Teloken C, Wyllie M. Standards for clinical trials in male sexual dysfunction. *J Sex Med* 2010;7:404–44.
- 35 Larsen SH, Wagner G, Heitmann BL. Sexual function and obesity. *Int J Obes* 2007;8:1189–98.