

Sexual functioning in a population-based study of men aged 40–69 years: the good news

P Enzlin^{1,4*}, R Mak², F Kittel³ and K Demyttenaere^{1,4}

¹Institute for Family and Sexuality Studies, Catholic University, Leuven, Belgium; ²Department of Public Health, Ghent University, Ghent, Belgium; ³Department of Epidemiology and Health Promotion, Public Health School, Université Libre de Bruxelles, Brussels, Belgium; and ⁴Department of Psychiatry, University Hospitals Gasthuisberg, Leuven, Belgium

The aim of the study was to provide cross-sectional data on age-related sexual functioning of men aged 40–69 y. The study was a randomised age-stratified community-based sample survey. In all, 799 men from two comparable middle-sized areas of Belgium participated in the study. Trained male nurses visited each participant at home and conducted a structured interview during which the participants filled out the International Index of Erectile Function (IIEF). The main outcome measures were scores on the IIEF questionnaire at item level. This study showed that 69% of the sample attempted to have intercourse during the past 4 weeks with an age-related increase in the proportion of sexually inactive men (11% at age 40–49 y; 25% at age 50–59 y; 52% at age 60–69 y; $P = 0.0001$). Almost 90% of sexually active men reported to be able to get and keep an erection until completion of intercourse, to ejaculate with a feeling of orgasm, and reported to be satisfied with their sexual partner relation and their overall sex life. About 75% of sexually active men reported to be (very) highly confident about their erectile functioning. Only 15% of sexually inactive men reported a high to very high frequency and strong to very strong level of sexual desire. Whereas 26% still reported high to very high confidence in their erectile capacity, 34% reported to be moderately to (very) satisfied with their sexual life. This study showed that sexuality still matters at middle to high age and that it deserves to be regarded as an important and continuing aspect of the overall adaptation to getting older.

International Journal of Impotence Research (2004) 16, 512–520. doi:10.1038/sj.ijir.3901221
Published online 15 April 2004

Keywords: sexuality; male sexual functioning; sexual health; community study; IIEF

Introduction

Sexual functioning is an important part of human life that contributes to the quality of life of men and couples.¹ The current knowledge about sexual functioning in the general population is, however, limited. The focus of attention in research and clinical work has been more on the age-related decrease of sexual functioning^{2–8} and on the prevalence, aetiology, pathogenesis and treatment of sexual dysfunctions.^{9–17} The increasing demands for sexual health care, however, implies that clinicians are regularly confronted with questions

concerning ‘normal sexual functioning’ at specific ages.⁴

Currently, there is still a lack of normative data on sexual functioning at different ages in a healthy population. The Kinsey survey and Olmsted study provide such data for the American population, but the results of these studies are not necessarily representative for a European population.^{18,19} Moreover, limited knowledge on sexual functioning is not only due to paucity in research but also due to methodological shortcomings.⁹ Most research on sexual functioning has been conducted among convenience samples recruited through advertisement,⁸ sexual dysfunction clinics/general hospital/private practice,^{3,12,13} universities⁵ or churches;¹¹ only a few investigations have been population based.^{6,7,10,14–19} In different studies, different methodologies have been used, which hinders the comparability of the results from different studies.⁹

Hence, this article aimed to provide cross-sectional data on sexual functioning of men aged

*Correspondence: P Enzlin, UZ Gasthuisberg, Department Liaison Psychiatry, Herestraat 49, Leuven 3000, Belgium. E-mail: paul.enzlin@uz.kuleuven.ac.be
Received 22 August 2003; revised 2 February 2004; accepted 6 February 2004

40–69 y old, and more particularly on frequency of sexual intercourse, frequency and level of sexual desire, erectile functioning, erection confidence, frequency of ejaculation and feelings of orgasm, satisfaction and enjoyment with intercourse, and satisfaction with overall sex life. These results are part of a population-based study that aimed the general ‘Assessment of Diseases in Ageing Men’ (ADAM) in which also male sexual functioning was measured.²⁰

Methods

Study sample

The study sample consisted of respondents of the ADAM study: a randomised, age-stratified (40–49, 50–59, 60–69 y), community-based sample survey that aimed to assess the prevalence of diseases in ageing men. The ADAM study was conducted from April to December 1999. In order to obtain a sample representative for the cultural diversity of Belgium, a randomly selected sample was used from the official register of the male population of Ghent (Flemish community) and Charleroi (French community), two comparable middle-sized Belgian urban areas with approximately 250 000 inhabitants each.²⁰ All selected men were first sent an invitation letter, in which they were asked to confirm their participation using a reply form free of charge. Those who did not reply in due time were contacted by telephone or were sent a reminder if no telephone was available. Sampling was continued until the target of 800 participants was reached. In total, 2508 invitation letters were sent out. In all, 893 subjects (35.6%) did not answer any letter, and 816 subjects (32.5%) could not be contacted due to wrong addresses, recent death or reported inability to answer the questions due to illness. Of those subjects who could be contacted ($n=1692$), 799 participated in this study yielding a response rate of 47%.

Data collection

Trained male nurses visited each participant at home and conducted a structured interview comprising among others sociodemographic variables (age, marital status, education and professional status) and a validated questionnaire regarding sexual history (International Index of Erectile Functioning (IIEF)).²¹ The IIEF is a well-validated instrument addressing five domains of male sexual function (erectile function, orgasmic function, sexual desire, intercourse satisfaction and overall

satisfaction). In this article, an alternative way to interpret data gathered by the IIEF is presented: an analysis of the IIEF-scores at question level is proposed. Each question of the IIEF is scored on a Likert-scale principle with scores ranging from ‘very low’ to ‘very high’. In order to provide an estimate of normal sexual functioning of men at different ages, we only relied on the highest scores of each question. This means that for example, for the first question ‘how often were you able to get an erection during sexual activity’, only men who reported ‘(almost) always’ or ‘most time’ would be regarded as functioning normally. Based on this item approach, important information on healthy sexual functioning at different ages could be gathered.

Statistical analyses

Analyses were performed using the Statistical Package for Social Sciences (SPSS—Version 10.0., Chicago, Inc., IL, USA). Spearman’s correlations were used to calculate the associations between variables. One-way ANOVA (with Bonferroni correction) was used to calculate differences between groups. Simple and stratified χ^2 tests were used to calculate the association between different variables. The level of significance used was $P<0.05$.

Results

Sexual activity

Overall, 69% of the entire sample reported to have been sexually active during the past 4 weeks. The proportion of men who reported to have been sexually inactive during the past 4 weeks increased with each successive older age group: 11% of those being 40–49 y old, 25% of those being 50–59 y old and even 52% of the oldest group refrained from sexual activity during the past 4 weeks ($\chi^2=107$; d.f. = 2; $P<0.0001$). Therefore, all further analyses were performed separately for sexually active and sexually inactive men.

Demographics

Of all sexually active men, 79% were married, 14% were divorced, 5% lived alone and 2% were widowers. The civil status of sexually active men was significantly different from that of sexually inactive men of whom 70% were married, 13% divorced, 12% lived alone and 5% were widowers ($\chi^2=19.3$; d.f. = 3; $P<0.001$). There were significant differences in the educational level of sexually

active and sexually inactive men ($\chi^2 = 22.6$; d.f. = 6; $P < 0.001$). Overall, 34% of the sample had more than 12 y of education, while this was the case for 38% of sexually active men and only 24% of sexually inactive men had so. Significant differences were found also for the professional situation of sexually active vs sexually inactive men ($\chi^2 = 80.3$; d.f. = 3; $P < 0.001$). Overall, 43% was professionally active: 52% of sexually active men and 21% sexually inactive men currently had a job, while 24% of sexually active men and 53% of sexually inactive men reported to be retired. There was an almost equal distribution of age categories: 31% of the participants was 40–49 y old, 31% was 50–59 y old and 38% of the sample consisted of men aged 60 y or older.

Frequency of sexual activity

Almost half of sexually active men (48%) attempted to have intercourse more than once a week (≥ 5 attempts; Table 1). This frequency of sexual activity, however, was inversely proportional to age: younger men were significantly more sexually active. In all, 63% percent of men aged 40–49 y, 44% of men aged 50–59 y and 32% of men aged 60–69 y attempted to have sexual intercourse more than once a week.

Frequency and level of sexual desire

In sexually active men, 47% reported to have felt sexual desire 'most times' or '(almost) always'. The frequency of sexual desire was also inversely

proportional to age: younger men reported to have felt significantly more sexual desire ($\chi^2 = 105.3$; d.f. = 4; $P < 0.0001$). In all, 59% of men aged 40–49 y, 46% of men aged 50–59 y and 33% of men aged 60–69 y reported to have sexual desire 'most times' or '(almost) always' (Table 2). Similar results were found for the level of sexual desire. In all, 50% rated their level of sexual desire as 'strong', to 'very strong', with younger men reporting a significantly higher level of sexual desire ($\chi^2 = 83.4$; d.f. = 4; $P < 0.0001$). In all, 57% of men aged 40–49 y, 49% of men aged 50–59 y and 41% of men aged 60–69 y reported a 'high' to 'very high' level of sexual desire (Table 3). In sexually active men, a significant association was found between the frequency of

Table 1 Number of attempts of sexual intercourse during the past 4 weeks of sexually active men (percentages)

N attempts	40–49 y	50–59 y	60–69 y	Total
1–2	28	49	52	129
	12.9	26.8	35.9	23.7
3–4	53	54	47	154
	24.4	29.5	32.4	28.3
5–6	43	18	14	75
	19.8	9.8	9.7	13.7
7–10	53	34	19	106
	24.4	18.6	13.1	19.4
11 +	40	28	13	81
	18.5	15.3	8.9	14.9
Total	217	183	145	545
	100	100	100	100

1. One-way ANOVA (overall group): $F = 15.58$, d.f. = 2; $P < 0.0001$.

One-way ANOVA with Bonferroni *post hoc* correction:

● Comparison of age 40–49 and 50–59 y: $P = 0.002$.

● Comparison of age 40–49 and 60–69 y: $P < 0.0001$.

● Comparison of age 50–59 and 60–69 y: $P = 0.081$.

Table 2 Frequency of sexual desire during the past 4 weeks per age category of both sexually active and sexually inactive men (percentages)

	40–49 y		50–59 y		60–69 y		Total	
	Active	Not active	Active	Not active	Active	Not active	Active	Not active
Almost never/a few times	16	11	36	37	46	105	98	153
	7.2	47.8	18.7	68.5	28.4	74.5	17.0	70.2
Sometimes	75	7	68	8	63	21	206	36
	33.6	30.4	35.2	15.1	38.9	14.9	35.6	16.5
Most times/almost always	132	5	89	9	53	15	274	29
	59.2	21.7	46.1	16.7	32.7	10.6	47.4	13.3
Total	223	23	193	54	162	140	578	218
	100	100	100	100	100	100	100	100

1. Analyses stratified for sexual activity revealed:

(a) for sexual activity, comparison of age categories revealed $\chi^2 = 40.1$, d.f. = 4, $P < 0.0001$.

(b) for sexual inactivity, comparison of age categories revealed $\chi^2 = 7.4$, d.f. = 4, $P = 0.11$.

2. Analyses stratified for age category:

(a) for men aged 40–49 y, comparison of sexual activity revealed $\chi^2 = 36.7$, d.f. = 2, $P < 0.0001$.

(b) for men aged 50–59 y, comparison of sexual activity revealed $\chi^2 = 50.4$, d.f. = 2, $P < 0.0001$.

(c) for men aged 60–69 y, comparison of sexual activity revealed $\chi^2 = 64.7$, d.f. = 2, $P < 0.0001$.

3. Level of sexual desire over different age groups revealed $\chi^2 = 105.3$, d.f. = 4; $P < 0.0001$.

Table 3 Level of sexual desire per age category of men who were and who were not sexually active in the past 4 weeks

	40–49 y		50–59 y		60–69 y		Total	
	Active	Not active	Active	Not active	Active	Not active	Active	Not active
Completely absent/very low/low	6	6	9	31	16	83	31	120
	2.7	26.1	4.7	57.4	9.9	59.3	5.4	55.3
Moderate	89	10	90	15	80	41	259	66
	39.9	43.5	46.6	27.8	50.3	29.3	44.8	30.4
Very strong/strong	128	7	94	8	66	16	288	31
	57.4	30.4	48.7	14.8	40.7	11.4	49.8	14.3
Total	223	23	193	54	162	140	578	217
	100	100	100	100	100	100	100	100

1. Analyses stratified for sexual activity revealed:

(a) for sexual activity comparison of age categories revealed $\chi^2 = 16.7$, d.f. = 4, $P = 0.002$.

(b) for sexually inactivity comparison of age categories revealed $\chi^2 = 10.5$, d.f. = 4, $P = 0.03$.

2. Analyses stratified for age category:

(c) for men aged 40–49 y, comparison of sexual activity revealed $\chi^2 = 26.2$, d.f. = 2, $P < 0.0001$.

(d) for men aged 50–59 y, comparison of sexual activity revealed $\chi^2 = 87.7$, d.f. = 2, $P < 0.0001$.

(e) for men aged 60–69 y, comparison of sexual activity revealed $\chi^2 = 87.3$, d.f. = 2, $P < 0.0001$.

3. Level of sexual desire over different age groups revealed $\chi^2 = 83.4$, d.f. = 4, $P < 0.0001$.

sexual activity and frequency of sexual desire for all age categories (40–49 y: Spearman's $r = 0.33$; 50–59 y: $r = 0.40$; 60–69 y: $r = 0.36$).

In sexually inactive men, a similar significant decline of frequency and level of sexual desire in proportion to age was found (Tables 2 and 3). Frequency and level of sexual desire were, however, low compared to sexually active men. In all, 22% of men aged 40–49 y, 17% of men aged 50–59 years and 11% of men aged 60–69 y reported to have sexual desire 'most times' or '(almost) always' (Table 2), while 29% of men aged 40–49 y, 16% of men aged 50–59 y and 13% of men aged 60–69 y reported a 'strong' to 'very strong' level of sexual desire (Table 3).

Erectile functioning

Overall, 90% of sexually active men reported that 'most times' or '(almost) always' they had good erectile functioning until completion of intercourse (Table 4). A more in-depth analysis of the data revealed a significant decrease of the percentage of men reporting good erectile functioning: older men reported less well erectile functioning than did younger men and overall a decrease of approximately 10% was seen from age 40 to 69 y (Table 4).

Erection confidence

Of all sexually active men, 76% reported 'high' to 'very high' confidence about their ability to get and

keep an erection, while only 5% reported 'low' to 'very low' confidence. Conversely, of all sexually inactive men, 26% reported 'high' to 'very high' confidence about their ability to get and keep an erection, while 58% reported 'low' to 'very low' confidence (Table 5). Analysis of these data per age category revealed a significant decline in erection confidence in proportion to age in both sexually active ($\chi^2 = 45.9$; d.f. = 8; $P < 0.001$) and sexually inactive men ($\chi^2 = 39.1$; d.f. = 8; $P < 0.001$). At the age of 40–49 y, 88% of sexually active men were very confident about the ability to get and maintain an erection, while 70% of sexually inactive men reported to be very confident about their erectile capacity. These proportions were quite different from those seen in the older age groups in which about 65%–69% of the sexually active men felt confident, while only 19–23% of the sexually inactive men reported to be very confident about their erectile ability (Table 5).

Ejaculation and feeling of orgasm

Table 6 reveals that ejaculation and feelings of orgasm (95%) are very well-conserved aspects of sexual functioning of men: 97% reported to ejaculate 'most times' or 'always', while 95% reported feelings of orgasm 'most times' or 'always'. These results further suggest that the ability to ejaculate and have an orgasmic feeling does not alter at higher age: no significant decline could be found over the age categories or ejaculation ($\chi^2 = 5.7$; d.f. = 4; $P = 0.22$) or feeling of orgasm ($\chi^2 = 8.0$; d.f. = 4; $P = 0.09$).

Table 4 Erectile functioning per age category for men who were sexually active during the past 4 weeks

	Able to get			Erections hard enough			Able to penetrate			Maintain erection after penetration			Maintain erection to completion		
	40–49 y	50–59 y	60–69 y	40–49 y	50–59 y	60–69 y	40–49 y	50–59 y	60–69 y	40–49 y	50–59 y	60–69 y	40–49 y	50–59 y	60–69 y
Almost never/a few times	3	5	7	3	11	12	8	11	4	4	8	15	4	5	11
Sometimes	1.4	2.7	4.8	1.4	6.0	8.3	4.4	7.6	1.8	1.8	4.4	10.3	1.8	2.7	7.6
	1	11	7	4	8	10	10	8	3	3	7	10	10	8	11
	0.5	6.0	4.8	1.8	4.4	6.9	5.5	5.5	1.4	1.4	3.8	6.9	4.6	4.4	7.6
Most times/ almost always	213	167	131	210	164	123	165	126	210	203	168	120	203	170	123
	98.2	91.3	90.3	96.8	89.6	84.8	98.6	90.2	96.8	93.5	91.8	82.8	93.5	92.9	84.8
Total	217	183	145	217	183	145	216	183	217	217	183	145	217	183	145
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

1. Able to get: $\chi^2 = 14.3$, d.f. = 4, $P = 0.006$.2. Erections hard enough: $\chi^2 = 16.6$, d.f. = 4, $P = 0.002$.3. Able to penetrate: $\chi^2 = 22.0$, d.f. = 4, $P < 0.0001$.4. Maintain after penetration: $\chi^2 = 21.9$, d.f. = 4, $P < 0.0001$.5. Maintain to completion: $\chi^2 = 11.2$, d.f. = 4, $P = 0.02$.*Satisfaction with intercourse and feelings of enjoyment*

Overall, 92% of men who were sexually active during the past 4 weeks were ‘most times’ or ‘always’ satisfied with sexual intercourse (Table 7). The proportion of men who were satisfied, however, significantly decreased with each successive older age group: 97% of the youngest group, 91% of those being 50–59 y old and 86% of the oldest group reported to be satisfied ‘most times’ or ‘always’ ($\chi^2 = 18.4$; d.f. = 4; $P = 0.001$). Although the percentages are somewhat lower, a similar pattern was found for the feelings of enjoyment: the ability to enjoy sexual intercourse significantly decreased in proportion to age (Table 7). Sexual intercourse was ‘highly’ to ‘very highly’ enjoyable for 77% of men aged 40–49 y old, 71% of those aged 50–59 y old and 61% of those aged 60–69 y ($\chi^2 = 12.7$; d.f. = 4; $P = 0.013$).

Satisfaction with partner relation and overall sex life

In general, sexually active men were satisfied with their sexual partner relation. This study did not reveal significant differences for satisfaction with the sexual partner relation between the age groups: 95% of men aged 40–49 y, 89% of men aged 50–59 y and 90% of men aged 60–69 y were ‘moderately’ to ‘very’ satisfied with their sexual partner relation. In all, 1, 2, and 3% respectively reported to be ‘moderately’ to ‘very’ dissatisfied with their sexual partner relation ($\chi^2 = 8.7$, d.f. = 8; $P = 0.37$).

Overall, sexually active men were satisfied with their overall sex life (Table 8). The proportion of men who were satisfied remained constant over the successive age groups: 87% of the youngest group, 84% of those being 50–59 y old and 80% of the eldest group reported to be ‘moderately’ to ‘very’ satisfied. Moreover, only 5, 6 and 9% of sexually active men in the three successive age groups were ‘moderately’ to ‘very’ dissatisfied about their overall sex life ($\chi^2 = 1.8$; d.f. = 4; $P = 0.77$).

Similarly, in sexually inactive men, the proportion of men who were satisfied remained constant over the successive age groups. Although these men were not sexually active during the past 4 weeks, 32% of men aged 40–49 y, 33% of men aged 50–59 y and 35% of men aged 60–69 y still were ‘moderately’ to ‘very’ satisfied with their overall sex life. However, higher numbers of sexually inactive men reported to be ‘moderately’ to ‘very’ dissatisfied: 46% of men aged 40–49 y, 39% of men aged 50–59 y and 33% of men aged 60–69 y were ‘moderately’ to ‘very’ dissatisfied with their overall sex life ($\chi^2 = 3.9$; d.f. = 4; $P = 0.43$).

Table 5 Erection confidence per age category for men who were and who were not sexually active in the past 4 weeks

Erection confidence	40–49 y		50–59 y		60–69 y		Total	
	Active	Not active	Active	Not active	Active	Not active	Active	Not active
Very low/Low	3	5	17	31	16	96	36	132
	1.4	13.8	8.9	58.5	9.9	68.6	6.3	61.7
Moderate	23	1	45	11	42	23	110	35
	10.4	4.8	23.4	20.8	25.9	16.4	19.1	16.4
High/Very high	196	15	130	11	104	21	411	47
	88.3	71.4	67.7	20.8	64.2	15.0	75.7	22.0
Total	222	21	192	53	162	140	576	214
	100	100	100	100	100	100	100	100

1. Analyses stratified for sexual activity revealed:

(a) for sexually activity, comparison of age categories revealed $\chi^2 = 37.9$, d.f. = 4, $P < 0.0001$.

(b) for sexually inactivity, comparison of age categories revealed $\chi^2 = 34.9$, d.f. = 4, $P < 0.0001$.

2. Analyses stratified for age category:

(a) for men aged 40–49 y, comparison of sexual activity revealed $\chi^2 = 30.6$, d.f. = 2, $P < 0.0001$.

(b) for men aged 50–59 y, comparison of sexual activity revealed $\chi^2 = 68.3$, d.f. = 2, $P < 0.0001$.

(c) for men aged 60–69 y, comparison of sexual activity revealed $\chi^2 = 116.8$, d.f. = 2, $P < 0.0001$.

3. Erection confidence over different age groups $\chi^2 = 133.2$, d.f. = 4; $P < 0.0001$.

Table 6 Frequency of ejaculation and feelings of orgasm during sexual activity for sexually active men during the past 4 weeks

	Ejaculation					Feeling of orgasm			
	40–49 y	50–59 y	60–69 y	Total		40–49 y	50–59 y	60–69 y	Total
Almost never/a few times	2	5	5	12	Almost never/a few times	4	3	6	13
	0.9	2.7	3.4	2.2		1.8	1.7	4.1	2.4
Sometimes		2	2	4	Sometimes	4	2	7	13
		1.1	1.4	0.7		1.8	1.1	4.8	2.4
Most times/always	214	175	138	527	Most times/always	209	176	145	517
	99.1	96.2	95.2	97.1		96.3	97.2	91.0	95.2
Total	216	182	145	543	Total	217	181	145	543
	100	100	100	100		100	100	100	100

1. Ejaculation: $\chi^2 = 5.7$, d.f. = 4, $P = 0.22$.

2. Feeling of orgasm: $\chi^2 = 8.0$, d.f. = 4, $P = 0.09$.

Table 7 Frequency of satisfaction and feelings of enjoyment with sexual intercourse for sexually active men during the past 4 weeks

	Satisfaction					Enjoyment			
	40–49 y	50–59 y	60–69 y	Total		40–49 y	50–59 y	60–69 y	Total
Almost never/a few times		5	9	14	No enjoyment/not very enjoyable	2	5	6	13
		2.7	6.2	2.6		0.9	2.7	4.2	2.4
Sometimes	7	11	12	30	Fairly	47	49	50	146
	3.2	6.0	8.3	5.5		21.7	26.9	34.7	26.9
Most times/always	210	167	124	501	Highly/very highly	168	128	88	384
	96.8	91.3	85.5	91.9		77.4	70.3	61.1	70.7
Total	217	183	145	545	Total	217	182	144	543
	100	100	100	100		100	100	100	100

1. Satisfaction: $\chi^2 = 18.4$, d.f. = 4, $P = 0.001$.

2. Enjoyment: $\chi^2 = 12.7$, d.f. = 4, $P = 0.013$.

Discussion

In the present study, 799 men from a general population sample aged 40–69 y old were interviewed and invited to fill out the IIEF, a validated

questionnaire that covers erectile function next to other aspects of sexual functioning. Although the IIEF is mostly used to evaluate dysfunction,²¹ we proposed an alternative interpretation of the IIEF-scores that could reveal information on age-related

Table 8 Satisfaction with overall sex life per age category for sexually active and sexually inactive men during the past 4 weeks

	40–49 y		50–59 y		60–69 y		Total	
	Active	Not active	Active	Not active	Active	Not active	Active	Not active
Very dissatisfied/moderately dissatisfied		10	12	21	14	46	36	77
	4.5	45.5	6.3	38.9	8.6	32.9	6.2	35.6
Equal	20	5	19	15	19	45	58	65
	9.0	22.7	9.9	27.8	11.7	32.1	10.1	30.1
Moderately satisfied/satisfied	193	7	161	18	129	49	483	74
	86.5	31.8	83.9	33.3	79.6	35.0	83.7	34.3
Total	223	22	192	54	162	140	577	216
	100	100	100	100	100	100	100	100

1. Analyses stratified for sexual activity revealed:

(a) for sexual activity, comparison of age categories revealed $\chi^2 = 1.8$, d.f. = 4, $P = 0.77$.

(b) for sexual inactivity, comparison of age categories revealed $\chi^2 = 3.9$, d.f. = 4, $P = 0.43$.

2. analyses stratified for age category

(a) for men aged 40–49 y, comparison of sexual activity revealed $\chi^2 = 52.2$, d.f. = 2, $P < 0.0001$.

(b) for men aged 50–59 y, comparison of sexual activity revealed $\chi^2 = 58.0$, d.f. = 2, $P < 0.0001$.

(c) for men aged 60–69 y, comparison of sexual activity revealed $\chi^2 = 62.3$, d.f. = 2, $P < 0.0001$.

3. Overall satisfaction over different age groups revealed $\chi^2 = 34.6$, d.f. = 4, $P < 0.0001$.

‘normal’ male sexual functioning. The age-related description of normal sexual functioning of men described in this article is based on the two highest scores of each item of the IIEF (eg most times or (almost) always possible to get an erection). As such, this approach can even be criticised for using very stringent criteria to define ‘normality’.

First, this study revealed that sexual functioning continued to play an important role in the lives of the men studied: 69% of the sample had been sexually active and attempted to have intercourse at least once during the past 4 weeks. This, however, does not imply that the remaining 31% of the sample were completely sexually inactive. The limited focus on current sexual function of the IIEF implies that the only conclusion that can be drawn from these results is that 31% of the sample did not attempt to have sexual intercourse during the past 4 weeks. It is still possible that these men were sexually active without having intercourse and/or that these men were still sexually active but less frequent than once a month. In the literature, important evidence can be found for the latter age-related decrease of sexual activity hypothesis. Mulligan and Moss² reported that the average frequency of sexual intercourse decreased from weekly (40–49 y) to monthly (50–69 y) and that sexual interest significantly decreased between the age of 40 and 69 y.² Pfeiffer³ also found a significant decline in sexual activity and interest with increasing age between the ages 40 and 69 y.³ Panzer *et al*¹⁹ also presented a similar decrease in sexual performance and sexual drive with increasing age. These observations could partially explain the progressive age-related increase of the proportion of men (from 11% (40–49 y) to 25% (50–59 y) and 52% (60–69 y)) who reported to be sexually inactive in this study that only evaluated sexual activity over the last 4

weeks. Moreover, analysis of the data of sexually inactive men also revealed a clear decline of frequency and level of sexual desire. The fact that in sexually inactive men both frequency and level of sexual desire were low could explain the sexual inactivity of these men during the past 4 weeks. Therefore, future studies should cover a broader time interval (>4 weeks) to unravel the age-related decrease of normal sexual functioning in more detail.

Second, this study did not only show the importance of sexuality for middle- to high-aged men, but also yielded a positive balance about the sexual capability of sexually active men aged 40–69 y old. Almost 90% of sexually active men in this age range reported still to be able to get and keep an erection until completion of intercourse, to ejaculate with a feeling of orgasm, and reported to be satisfied with their sexual partner relation and with their overall sex life. Of all sexually active men, about 75% reported to be (very) highly confident about their erectile functioning. In summary, these results showed that the known age-related decrease of sexual functioning is rather mild in sexually active men, who preserve their sexual capability up to high age.

Third, the description of sexual functioning of sexually inactive men, that is, men who refrained from sexual activity during the past 4 weeks, however, was less extensive due to an insufficient evaluation of their sexual capability. As already mentioned, only 15% of sexually inactive men reported a (very) high frequency and (very) strong level of sexual desire, which could partially explain their not being sexually active in the past 4 weeks. Furthermore, there is a tendency in the literature to equal ‘sexual inactivity’ and ‘low confidence in erectile functioning’ as ‘erectile dysfunction’.

However, this interpretation could be criticised for several reasons. In our study, about a quarter of sexually inactive men still reported (very) high confidence in their erectile capacity. Important in this respect is, however, the decrease of erectile confidence in sexually inactive men between those aged 40–49 y (73% (very) highly confident) and those aged 50–59 y (23% (very) highly confident), suggesting that the age of 50 y is an important milestone for erectile confidence. It could be questioned, however, whether it is opportune to make a 'diagnosis' of erectile dysfunction based on one simple question. The 'one-question approach' has the risks of leading to an overestimation of erectile dysfunction due to an underestimation of erectile functioning of men who due to specific circumstances (eg noninterest of the partner, unavailability of a partner, relational conflict), are not satisfied about their sexual life. Satisfaction with overall sex life is the last aspect that has been evaluated for sexually inactive men. Although these men were sexually inactive during the past 4 weeks, a third of them still reported to be moderately to very satisfied with their sex life. Overall, about one-third reported to be moderately to very dissatisfied, with again a clear distinction between those aged 40–49 y (48%) and those aged 50–59 y (36%). These results confirm that sexual inactivity is far more being experienced as an important problem for younger men.

This study has several limitations. Although the response rate achieved in this study (47%) seems to be low, it is similar to that of other studies inquiring about sexual relationships. Mulligan and Moss² reported a completion rate of 41%, and in the study of Dunn *et al*²² 44% replied to the survey. This response rate is higher than that of the Star-Weiner²³ report (14%) and that of Bretschneider and Mc Coy²⁴ (34%), but lower than the 90% response rate reported by Pfeiffer *et al*.³ The cross-sectional design of the study hinders the temporal interpretability of the results: the results only indicated how persons of a particular age function in comparison with persons of different age. This implies that no conclusions can be drawn about how individuals change over time. In order to understand better the suggested effects of ageing, longitudinal studies are required. As with all studies on sexual functioning, this study can also be criticised based on response bias: persons who participate in studies on sexual function may have fewer inhibitions than those who refused to participate. The interpretation of the data can be flawed by the fact that no clinical examination was performed and that all data were based on self-report.

In conclusion, this study showed that sexuality still matters at older age and that it deserves to be regarded as an important and continuing aspect of the overall adaptation to old age. Therefore, it is important in both research and clinical practice that

sexuality is not regarded as an all or nothing phenomenon. The data presented in this study may be useful in establishing a point of reference of 'normal' sexual functioning in the general population and suggest that the transition from the fourth to the fifth decade seems to be a turning point in male's sexual life. Longitudinal research that covers a broader time interval is necessary to confirm these results and to refine our understanding of the age-related decrease of sexual functioning of men.

Acknowledgement

The 'Assessment of Diseases in Ageing Men' (ADAM study) was supported by an educational grant of Pfizer Belgium.

References

- 1 Kermode S, MacLean D. A study of the relationship between quality of life, health and self-esteem. *Aust J Adv Nurs* 2001; **19**: 33–40.
- 2 Mulligan T, Moss R. Sexuality and aging in male veterans: a cross-sectional study of interest, ability and activity. *Arch Sex Behav* 1991; **20**: 17–25.
- 3 Pfeiffer E, Verwoerd A, Davis G. Sexual behavior in middle life. *Am J Psychiatry* 1972; **128**: 1262–1267.
- 4 Pearlman C.. Frequency of intercourse in males at different ages. *Med Aspects Hum sexuality* 1972; **November**: 92–113.
- 5 Schiavi R *et al*. Healthy aging and male sexual function. *Am J Psychiatry* 1990; **147**: 766–771.
- 6 Diokno A, Brown M, Herzog R. Sexual function in the elderly. *Arch Intern Med* 1990; **150**: 197–200.
- 7 George L, Weiler S. Sexuality in middle and late life. The effects of age, cohort and gender. *Arch Gen Psychiatry* 1981; **38**: 919–923.
- 8 Reading A, Wiest W. An analysis of self reported sexual behavior in a sample of normal males. *Arch Sex Behav* 1984; **13**: 69–83.
- 9 Simons J, Carey M. Prevalance of sexual dysfunctions: results from a decade of research. *Arch Sex Behav* 2001; **30**: 177–219.
- 10 Laumann E, Paik A, Rosen R. Sexual dysfunction in the United States. *Prevalence and predictors*. *JAMA* 1999; **281**: 537–544.
- 11 Frank E, Anderson C, Rubinstein D. Frequency of sexual dysfunction in 'normal' couples. *N Engl J Med* 1978; **299**: 111–115.
- 12 Frenken J, Van Tol P. Sexual problems in gynaecological practice. *J Psychosom Obstet Gyn* 1987; **6**: 143–155.
- 13 Bhugra D, Cordle C.. Sexual dysfunction in Asian couples. *BMJ* 1986; **292**: 111–112.
- 14 Osborn M, Hawton K, Gath D. Sexual dysfunction among middel aged women in the community. *BMJ* 1988; **269**: 959–962.
- 15 Feldman HA *et al*. Impotence and its medical and psychosocial correlates: results of the Massachusetts Male Aging Study. *J Urol* 1994; **151**: 54–61.
- 16 Braun M *et al*. Epidemiology of erectile dysfunction: results of the 'Cologne Male Survey'. *Int J Impot Res* 2000; **12**: 305–311.
- 17 Martin-Morales A *et al*. Prevalence and independent risk factors for erectile dysfunction in Spain: results of the Epidemiologia de la Disfuncion Erectil Masculina Study. *J Urol* 2001; **166**: 569–574.

- 18 Kinsey AC *et al.* *Sexual Behaviour in the Human Male*. WB Saunders Co: Philadelphia, PA, 1948.
- 19 Panser LA *et al.* Sexual function of men ages 40–79 years: the Olmsted County study of urinary symptoms and health status among young men. *J Am Geriatr Soc* 1995; **43**: 1107–1111.
- 20 Mak R, De Backer G, Kornitzer M, De Meyer JM. Prevalence and correlates of erectile dysfunction in a population-based study in Belgium. *Eur Urol* 2002; **41**: 132–138.
- 21 Rosen RC *et al.* The international index of erectile function (IIEF): a multidimensional scale for assessment of erectile dysfunction. *Urology* 1997; **49**: 822–830.
- 22 Dunn KM, Croft PR, Hackett GI. Satisfaction in the sex life of a general population sample. *J Sex Mar Ther* 2000; **26**: 141–151.
- 23 Starr BD, Weiner MB. *Sex and Sexuality in the Mature Years*. Stein and Day: Briarcliff Manor, NY, 1981, p 25.
- 24 Bretschneider JG, McCoy NL. Sexual interest and behavior in healthy 80- to 102-year-olds. *Arch Sex Behav* 1988; **17**: 109–129.