

Prevalence of Masturbation and Associated Factors in a British National Probability Survey

Makeda Gerressu · Catherine H. Mercer ·
Cynthia A. Graham · Kaye Wellings · Anne M. Johnson

Received: 18 April 2006 / Revised: 19 September 2006 / Accepted: 19 September 2006 / Published online: 27 February 2007
© Springer Science+Business Media, LLC 2007

Abstract A stratified probability sample survey of the British general population, aged 16 to 44 years, was conducted from 1999 to 2001 ($N = 11,161$) using face-to-face interviewing and computer-assisted self-interviewing. We used these data to estimate the population prevalence of masturbation, and to identify sociodemographic, sexual behavioral, and attitudinal factors associated with reporting this behavior. Seventy-three percent of men and 36.8% of women reported masturbating in the 4 weeks prior to interview (95% confidence interval 71.5%–74.4% and 35.4%–38.2%, respectively). A number of sociodemographic and behavioral factors were associated with reporting masturbation. Among both men and women, reporting masturbation increased with higher levels of education and social class and was more common among those reporting sexual function

problems. For women, masturbation was more likely among those who reported more frequent vaginal sex in the last four weeks, a greater repertoire of sexual activity (such as reporting oral and anal sex), and more sexual partners in the last year. In contrast, the prevalence of masturbation was lower among men reporting more frequent vaginal sex. Both men and women reporting same-sex partner(s) were significantly more likely to report masturbation. Masturbation is a common sexual practice with significant variations in reporting between men and women.

Keywords Masturbation · Sexual behavior · Sex survey · Gender differences

Introduction

From a public health perspective, masturbation is considered a safe sexual activity. It has been promoted as a safe alternative to higher risk practices by both researchers and clinicians (Pinkerton, Bogart, Cecil, & Abramson, 2002). It has been recommended as a way for people to familiarize themselves with their body and their sexual responses (Zamboni & Crawford, 2002) and used as a treatment for premature ejaculation and orgasmic disorders in women (Heiman & LoPiccolo, 1988). Masturbation has also been presented as a way people in later life might fulfil their sexual needs if experiencing difficulty finding new sexual partners (Kontula & Haavio-Mannila, 2002).

Despite its sexual health potential, masturbation has been stigmatized over the centuries. Held as a moral sin by Judaism, Islam, and Christianity, masturbation became perceived as a mortal threat to health in the 18th century. It was renamed “onanism” and for two hundred years physicians warned patients of the multitude of illnesses associated with

M. Gerressu · C. H. Mercer · A. M. Johnson
Centre for Sexual Health and HIV Research,
Department of Primary Care and Population Sciences,
University College London,
Mortimer Market Centre, off Capper Street, London, England

C. A. Graham
Oxford Doctoral Course in Clinical Psychology, University of
Oxford, Warneford Hospital,
Oxford, England

K. Wellings
Centre for Sexual and Reproductive Health Research, London
School of Hygiene and Tropical Medicine,
London, England

M. Gerressu (✉)
Centre for Sexual Health and HIV Research,
Department of Primary Care and Population Sciences,
University College London,
Mortimer Market Centre, off Capper Street,
London WC1E 6JB, England
e-mail: mgerressu@gum.ucl.ac.uk

masturbation (Laqueur, 2003). It was claimed that masturbation would lead *inter alia* to insanity, fits, blindness, and impotence (Bullough, 2002). Many “cures” were developed, ranging from circumcision for both men and women to castration (Darby, 2003). According to Laqueur (2003), this anxiety stemmed from the belief at the time, that allowing people to withdraw into their isolated private sexual fantasy world would be socially disruptive.

In the 20th century, with better understanding of the causes of sexually transmitted infections and their symptoms, and the influence of psychoanalysts, artists, the feminist and gay rights movements, views of masturbation changed (Laqueur, 2003). The topic remains one that tends not to be openly discussed and negative attitudes persist (Coleman, 2002) but it is also a frequently raised subject on sex and relationship phone lines and Internet sites in a number of countries (Barbey, 1991; Cardamakis, Vinakos, Lambou, & Papathanasiou, 1993; International Planned Parenthood Federation, 1996; Kitamura, 1990; Kuriansky, 1996).

Kinsey’s sexual behavior studies in the 1940s and 1950s first provided evidence on the frequency and distribution of masturbation (Kinsey, Pomeroy, & Martin, 1953; Kinsey, Pomeroy, Martin, & Gebhard, 1948). For all the negative views surrounding the practice, it was found to be more common than previously thought. A substantial gender difference in the incidence of masturbation was reported, and associations between masturbation and various sociodemographic variables, such as education and religion, were identified. Some 40 years later, masturbation was excluded altogether from the first National Survey of Sexual Attitudes and Lifestyles in Britain (Natsal 1990). This was a decision prompted partly by its low risk status (Editorial, 1994) and partly as a result of developmental qualitative research findings that masturbation elicited a level of “awkwardness and embarrassment” (Spencer, Faulkner, & Keegan, 1988).

More recent national surveys of sexual behavior in several countries have included questions on masturbation (Béjin, 1996; Kontula & Haavio-Mannila, 2002; Laumann, Gagnon, Michael, & Michaels, 1994; Spira, Bajos, & ACSF Group, 1994). The reported rates of masturbation varied widely, in part reflecting methodological differences in terms of survey design, question wording, and method of questioning. One consistency across studies was the striking gender difference in the prevalence of masturbation (Kontula & Haavio-Mannila, 2002; Laumann et al., 1994; Oliver & Hyde, 1993; Spira et al., 1994). Gender differences in many other sexual behaviors have narrowed, but the gender gap in reported masturbation remains substantial (Hyde, 2005).

Laumann et al. (1994) found that the largest proportion of their participants chose “to release sexual tension” and to obtain “physical pleasure” as their reasons for masturbating but other reasons given were “to relax,” to “get to sleep” or because their current partner did not want sex (the latter

was reported by three times as many men as women). The most common reasons were perhaps the most obvious; however, there has been debate around whether masturbation is a substitute for sex with a partner (Dekker & Schmidt, 2002; Kontula & Haavio-Mannila, 2002; Pinkerton et al., 2002) or a behavior that is part of a wide repertoire of acts aimed at sexual expression and satisfaction, irrespective of partnership status (Laumann et al., 1994; Pinkerton et al., 2002). Some studies report that while frequency of intercourse in the last four weeks decreased with the increased duration of the relationship, frequency of masturbation actually increased with time in long lasting unions (Dekker & Schmidt, 2002; Kontula & Haavio-Mannila, 2002).

Most studies of masturbation have used convenience samples in clinics, universities, or community settings and have explored associations between masturbation frequency and variables such as relationship status, other sexual activities, contraceptive use, and attitudes such as guilt (Dekker & Schmidt, 2002; Pinkerton et al., 2002; Robinson, Bocking, & Harrell, 2002). However, findings from convenience samples are not generalizable, and there are few robust data internationally that permit us to measure prevalence and identify correlates of masturbation from representative, general population samples.

Britain’s second National Survey of Sexual Attitudes and Lifestyles (Natsal 2000), conducted between 1999 and 2001, included for the first time a question on masturbation (Erens et al., 2001; Johnson et al., 2001). In this article, we used these nationally representative, contemporary data to explore the prevalence of reporting masturbation and to identify associated sociodemographic, sexual behavioral, and attitudinal factors.

Method

Participants

Natsal 2000 was a stratified probability sample survey of the general population aged 16 to 44 years, resident in Britain. In total, 11,161 people (4762 men and 6399 women) were interviewed between May 1999 and February 2001. Details of the methodology and question wording were published elsewhere (Erens et al., 2001; Johnson et al., 2001). Briefly, a sample of 40,523 addresses was selected from the small-user Postcode Address File for Britain with a multistage probability cluster design, with over-sampling in Greater London.

Procedure

Interviewers visited all selected addresses and recorded the number of residents aged 16 to 44 years. One resident from

every household was invited by random selection to participate in the study. Natsal 2000 achieved a response rate of 65.4%, which is in line with other major surveys conducted in Britain (Lynn & Clarke, 2002). Trained interviewers conducted face-to-face interviews in participants’ homes, including a computer-assisted self-interview (CASI). The face-to-face interview included questions on sociodemographics, attitudes, sexual attraction, and experience. Participants who reported no sexual experience of any kind in the face-to-face interview, and those aged 16 and 17 years with some heterosexual experience but no heterosexual intercourse or same-sex experience reported in screening questions, were not given the CASI.

In the CASI, eligible participants were asked questions on various sexual practices, including masturbation: “When, if ever, was the last occasion you masturbated? That is, aroused yourself sexually?” Participants were given a choice of seven response options: in the last 7 days; between 7 days and 4 weeks ago; between 4 weeks and 6 months ago; between 6 months and 1 year ago; between 1 year and 5 years ago; longer than 5 years ago; never masturbated or aroused myself sexually.

The study was approved by the University College Hospital and North Thames Multi-Centre Research Ethics Committee and all the Local Research Ethics Committees in Britain.

Data analysis

All analyses were performed using the survey analysis functions of STATA 7.0 to account for stratification, clustering, and weighting of the data. The data were weighted to correct for unequal selection probabilities, including over-sampling in Greater London, and to match Britain’s age/sex population profile (Erens et al., 2001; Johnson et al., 2001).

As in previous publications (Fenton et al., 2005; Johnson et al., 2001; Wellings et al., 2001), we used binary logistic regression to obtain odds ratios (OR) to compare estimates for participants who did and did not report masturbation in

the last 4 weeks. We also present ORs adjusting for selected sociodemographic characteristics (see Table 2), numbers of sexual partners in the last year, and whether or not participants reported same-sex genital contact (ever). Statistical significance was considered as $p < .05$ for all analyses.

Results

Prevalence of masturbation

Ninety-five percent of men and 71.2% of women reported that they had masturbated at some point in their lives (Table 1). Seventy-three percent of men and 36.8% of women reported masturbating in the four weeks before their interview, while approximately half of the men (51.7%) and one in six women (17.8%) reported masturbating in the previous seven days. This gender difference in prevalence was highly statistically significant, $\chi^2(1) = 1861.15, p < .0001$.

Sociodemographic factors

Table 2 shows that reporting masturbation in the last four weeks (referred hereafter for brevity as “reporting masturbation”) was significantly associated with age for men and women, with prevalence highest among those aged 25–34. Previously married and single men were significantly more likely to report masturbation than married or cohabiting men. This was true even after adjusting for sociodemographic factors. Among women, cohabiting, single, and previously married women were more likely to report masturbation than married women, an association which remained significant after adjustment. Both men and women with children were significantly less likely to report masturbation, even after adjustment.

Higher educational achievement and higher social class were both associated with high prevalence of reporting masturbation, associations that remained after adjustment. Men and women who self-reported their ethnicity as “white”

Table 1 Last occasion of masturbation by gender

	Men % (95% CI)	Women % (95% CI)
Denominator (unweighted, weighted)	4410, 5281	5999, 5132
Last occasion of masturbation ^a		
Last 7 days	51.7% (50.0%–53.3%)	17.8% (16.7%–18.8%)
Between 7 days and 4 weeks ago	21.3% (20.0%–22.7%)	19.0% (17.9%–20.1%)
Between 4 weeks and 6 months ago	8.3% (7.4%–9.2%)	13.7% (12.8%–14.7%)
Between 6 months and 1 year ago	4.3% (3.7%–5.0%)	6.5% (5.8%–7.2%)
Between 1 year and 5 years ago	4.6% (3.9%–5.3%)	7.7% (7.0%–8.5%)
Longer than 5 years ago	4.5% (3.9%–5.3%)	6.5% (5.8%–7.2%)
Never	5.4% (4.7%–6.2%)	28.8% (27.6%–30.1%)
<i>p</i> value for gender difference	<i>p</i> < .0001	

^aParticipants were asked “When, if ever, was the last occasion you masturbated? That is, aroused yourself sexually?”

Table 2 Selected sociodemographic factors associated with reporting masturbation in the last 4 weeks by gender

	Men		Women		Denominator (unweighted/weighted)		Denominator (unweighted/weighted)	
	Prevalence% (95% CI)	Crude OR (95% CI)	Adjusted OR ^a (95% CI)	Prevalence% (95% CI)	Crude OR (95% CI)	Adjusted OR ^a (95% CI)	Denominator (unweighted)	Denominator (weighted)
All	73.0% (71.5%–74.4%)	$p < .0001$	$p = .0001$	36.8% (35.4%–38.2%)	$p = .0308$	$p < .0001$	4410, 5281	5999, 5132
Age								
16–24	72.6% (69.3%–75.6%)	1.00	1.00	33.9% (31.0%–36.9%)	1.00	1.00	1033, 1272	1224, 1244
25–34	76.9% (74.6%–79.0%)	1.26 (1.03–1.53)	1.69 (1.32–2.16)	38.8% (36.7%–41.0%)	1.24 (1.05–1.45)	1.53 (1.25–1.87)	1708, 2037	2451, 1994
35–44	69.2% (66.7%–71.6%)	.85 (.70–1.03)	1.36 (1.04–1.79)	36.5% (34.4%–38.8%)	1.12 (.95–1.32)	1.73 (1.39–2.15)	1669, 1972	2324, 1914
Marital status								
Married	68.5% (66.1%–70.9%)	1.00	$p < .0001$	33.7% (31.7%–35.7%)	1.00	$p = .0003$	1521, 2207	2431, 2358
Cohabiting	70.8% (67.0%–74.4%)	1.12 (.90–1.38)	1.01 (.79–1.29)	40.4% (37.2%–43.6%)	1.33 (1.14–1.56)	1.33 (1.11–1.59)	642, 912	984, 972
Previously married ^b	83.8% (79.1%–87.6%)	2.37 (1.70–3.30)	2.81 (1.97–4.01)	39.2% (35.3%–43.2%)	1.27 (1.05–1.54)	1.50 (1.23–1.84)	312, 238	677, 398
Single, never married	77.9% (75.6%–80.0%)	1.62 (1.36–1.92)	1.70 (1.29–2.24)	38.9% (36.4%–41.5%)	1.26 (1.09–1.44)	1.25 (1.04–1.51)	1929, 1918	1900, 1399
Any children								
No	77.8% (75.9%–79.5%)	1.00	$p = .010$	43.4% (41.1%–45.7%)	1.00	$p < .0001$	2557, 2824	2288, 1978
Yes	67.5% (65.1%–69.7%)	.59 (.51–.69)	.73 (.59–.93)	32.7% (31.0%–34.3%)	.63 (.56–.71)	.66 (.57–.77)	1853, 2457	3711, 3154
Social class								
I/II	80.0% (77.7%–82.1%)	1.00	$p < .0001$	44.5% (41.9%–47.2%)	1.00	ns	1578, 1838	1735, 1393
III (non-manual & manual)	71.6% (69.2%–73.8%)	.63 (.52–.75)	.73 (.59–.91)	36.4% (34.3%–38.5%)	.71 (.62–.82)	.97 (.82–1.14)	1734, 2142	2399, 2092
IV/V/unemployed	62.6% (58.7%–66.4%)	.42 (.34–.52)	.54 (.42–.70)	30.7% (27.9%–33.6%)	.55 (.47–.65)	.89 (.73–1.09)	804, 956	1212, 1057
Education								
Degree	82.2% (79.5%–84.7%)	1.00	$p < .0001$	49.9% (46.7%–53.0%)	1.00	$p < .0001$	1065, 1182	1216, 935
A-level	77.1% (74.6%–79.4%)	.73 (.58–.91)	.81 (.63–1.05)	40.7% (38.0%–43.5%)	.69 (.58–.82)	.71 (.59–.85)	1392, 1690	1567, 1396
GCSE/O-level	69.0% (66.3%–71.5%)	.48 (.39–.60)	.58 (.45–.76)	32.6% (30.5%–34.7%)	.49 (.41–.57)	.53 (.44–.65)	1444, 1811	2351, 2088
Foreign qualification	55.7% (36.9%–73.0%)	.27 (.12–.59)	.31 (.13–.77)	37.3% (24.5%–52.1%)	.60 (.32–1.11)	.61 (.29–1.28)	38, 35	59, 45
None	55.3% (50.1%–60.4%)	.27 (.20–.35)	.37 (.27–.52)	23.9% (20.8%–27.3%)	.32 (.25–.39)	.36 (.27–.48)	464, 555	790, 651
Ethnicity								
White	74.7% (73.2%–76.2%)	1.00	$p < .0001$	37.4% (36.0%–38.9%)	1.00	$p = .0240$	3958, 4844	5389, 4734
Black Caribbean	53.6% (41.1%–65.7%)	.39 (.24–.65)	.38 (.22–.66)	32.6% (24.3%–42.2%)	.81 (.53–1.22)	.76 (.49–1.19)	91, 77	140, 71
Black African	42.5% (29.5%–56.7%)	.25 (.14–.44)	.16 (.09–.31)	21.1% (12.6%–33.2%)	.45 (.24–.83)	.40 (.22–.75)	73, 52	90, 40
Indian	49.5% (37.5%–61.5%)	.33 (.20–.54)	.35 (.20–.63)	32.5% (21.2%–46.3%)	.81 (.45–1.44)	.65 (.34–1.26)	71, 75	91, 86
Pakistani	52.7% (33.2%–71.3%)	.38 (.17–.85)	.58 (.23–1.44)	10.0% (3.2%–27.6%)	.19 (.05–.64)	.37 (.10–1.37)	29, 43	36, 34
Other	60.1% (51.3%–68.3%)	.51 (.35–.74)	.50 (.32–.79)	33.1% (26.4%–40.7%)	.83 (.60–1.15)	.88 (.61–1.26)	180, 182	241, 156
Religiosity ^c								
No	73.7% (72.2%–75.2%)	1.00	ns	37.6% (36.1%–39.1%)	1.00	$p = .004$	3961, 4786	5132, 4455
Yes	66.1% (61.0%–70.9%)	.69 (.55–.88)	.79 (.59–1.05)	31.7% (28.3%–35.4%)	.77 (.65–.92)	.76 (.63–.93)	442, 488	855, 667

^a Odds ratio (OR) adjusted for all variables in Table 2.^b Separated, divorced or widowed.^c Religion and/or beliefs very/fairly important and attend religious services/meetings at least once a month.

were significantly more likely to report masturbation than those in other ethnic groups (crude OR for reporting masturbation by white participants relative to non-white participants: 2.49 (95% CI 1.97–3.16, $p < .0001$) and 1.42 (95% CI 1.13–1.79, $p = .003$) for men and women, respectively). For both men and women, reported religious denomination was not significantly associated with reporting masturbation after controlling for the other sociodemographic factors listed in Table 2 (data not shown). However, those who reported their religion and/or religious beliefs as “very” or “fairly important” and who attended religious services/meetings at least once a month were less likely to report masturbation. After controlling for other sociodemographic factors, this association was only significant among women.

Factors relating to first/early sexual experience

Participants who said that they found it difficult to talk to one or both of their parents about sex when they were growing up (see footnote to Table 3 for question wording) were more likely to report masturbation. After adjustment, this association remained significant only for women. A significantly larger proportion of women who reported first intercourse before age 16 reported masturbation in the last four weeks (adjusted OR 1.19, Table 3). This association was not observed for men. Among those participants who reported ever having had homosexual sex (defined as genital contact with someone of the same sex), 93.1% of men and 69.1% of women reported masturbation, in contrast to 71.8% and 35.1%, respectively, among those who did not report such experience ($p < .0001$ for both men and women).

Factors relating to current/recent health and sexual behavior

Prevalence of masturbation declined with worse self-perceived general health but this association remained significant only among women after adjustment. There was no significant association with smoking but masturbation was more likely to be reported with reporting greater alcohol consumption (Table 4).

The prevalence of masturbation was associated with frequency of partnered sexual activity in the last four weeks but the direction of the association was reversed for men and women (Table 5). For women, prevalence increased from 33.8% among those reporting sex less than four times in the last four weeks (corresponding to the median number of occasions (Johnson et al., 2001)) to 47.2% among those women reporting at least 16 occasions. In contrast, the prevalence of masturbation was most frequent among men reporting less than four occasions of sex in the last four weeks. These

associations remained significant in multivariate analysis. Gender differences were also evident in terms of the relationship between masturbation and the occurrence of other sexual activities. For women, reporting vaginal, oral, anal, or other genital contact not leading to intercourse in the last four weeks was significantly associated with also reporting masturbation in this time frame. However, no such association was evident for men. Indeed, men who reported vaginal sex were significantly less likely to report masturbation (70.5% vs. 80.8%, adjusted OR .59).

In terms of sexual risk for STI/HIV, after adjusting for potential confounding factors, there was no significant association between reporting masturbation and unsafe sex, defined here as reporting at least two partners in the last year and inconsistent condom use in the last four weeks (Johnson et al., 2001). Increasing partner numbers was associated with reporting masturbation for women, with prevalence doubling from 27.8% among women reporting no partners in the last year to 58.5% of women reporting at least five partners in this time frame, an association that remained significant after adjustment. An association was also observed among men but there was no evidence of any linear trend and this association was not significant after adjustment.

The duration of the participant’s most recent partnership was associated to some extent with masturbation. In univariate analysis, with increasing length of partnership, men were significantly less likely to report masturbation, while for women, there was some evidence of increasing likelihood to report masturbation. These associations were not significant after adjustment.

Men and women reporting at least one sexual function “problem(s)” lasting at least one month in the last year were significantly more likely to report masturbation. Considering specific “problems,” participants reporting lacking interest in sex (men only), anxiety about performance, inability to experience orgasm, and/or premature orgasm, problems achieving and/or maintaining an erection (men only, not significant after adjustment) and trouble lubricating (women only) were significantly more likely to report masturbation. Reporting “persistent problems,” defined as sexual function “problems” lasting at least six months in the last year (Mercer et al., 2003), was also associated with masturbation (data not shown in Table 6), although only for men (adjusted OR 1.63, 95% CI 1.11–2.40, $p = .013$).

It is worth noting that among women who did not report orgasm “problems,” there was a significant increase in reporting masturbation with increasing numbers of occasions of sex in the last four weeks, while no such significant association was observed for women who did report an inability to experience orgasm. There was no such interaction “effect” for men.

Table 3 Selected factors relating to first/early sexual experience and their association with reporting masturbation in the last 4 weeks by gender

	Men		Women		Crude OR (95% CI)	Adjusted OR ^a (95% CI)	Crude OR (95% CI)	Adjusted OR ^a (95% CI)	Denominator (unweighted/ weighted)
	Prevalence% (95% CI)	Denominator (unweighted/ weighted)	Prevalence% (95% CI)	Denominator (unweighted/ weighted)					
All	73.0% (71.5%–74.4%)	4410, 5281	36.8% (35.4%–38.2%)	4410, 5281	<i>p</i> = .003	<i>p</i> = .035			5999, 5132
Was difficult to talk about sex with one or both parent(s) when growing up ^b						ns			
No	72.3% (70.7%–73.8%)	1.00	35.9% (34.4%–37.4%)	3871, 4675	1.00	1.00	1.00	1.00	4961, 4288
Yes	79.8% (75.0%–84.0%)	1.52 (1.14–2.03)	42.0% (38.3%–45.9%)	364, 420	1.24 (.91–1.70)	1.22 (1.01–1.46)	1.30 (1.09–1.53)	1.22 (1.01–1.46)	821, 691
Had first sex before age 16 ^c						ns			
No	73.5% (71.7%–75.2%)	1.00	35.8% (34.3%–37.3%)	3141, 3739	1.00	1.00	1.00	1.00	4749, 4038
Yes	71.8% (68.9%–74.5%)	.92 (.78–1.09)	40.4% (37.4%–43.5%)	1269, 1542	1.04 (.86–1.26)	1.19 (1.01–1.40)	1.22 (1.06–1.40)	1.19 (1.01–1.40)	1250, 1094
Ever had homosexual sex (with genital contact)						<i>p</i> < .0001			
No	71.8% (70.2%–73.3%)	1.00	35.1% (33.8%–36.6%)	4097, 4986	1.00	1.00	1.00	1.00	5674, 4885
Yes	93.1% (89.3%–95.6%)	5.28 (3.25–8.58)	69.1% (62.9%–74.7%)	313, 295	4.19 (2.55–6.88)	4.12 (3.10–5.48)	4.12 (3.10–5.48)	3.32 (2.44–4.52)	325, 247

^a Odds ratio (OR) adjusted for age, marital status, any children, ethnicity (coded white vs. other), social class, ever had homosexual sex, partner numbers in the last year.

^b The corresponding question was worded “Now I’d like to ask you some questions about when you were growing up and learning about sex. When you were about 14, did you find it easy or difficult to talk to your parent(s) about sexual matters, or didn’t you discuss sexual matters with him/her/them at that age?”

^c Heterosexual/homosexual.

Table 4 Selected factors relating to current health and their association with reporting masturbation in the last 4 weeks by gender

	Men		Women		Denominator (unweighted/weighted)	Adjusted OR ^a (95% CI)	Crude OR (95% CI)	Adjusted OR ^a (95% CI)	Denominator (unweighted/weighted)
	Prevalence% (95% CI)	Crude OR (95% CI)	Prevalence% (95% CI)	Crude OR (95% CI)					
All	73.0% (71.5%–74.4%)		36.8% (35.4%–38.2%)		4410, 5281				5999, 5132
Self-perceived general health		<i>p</i> = .0145		<i>p</i> = .0010				<i>p</i> = .0254	
Very good	73.6% (71.4%–75.8%)	1.00	39.2% (37.2%–41.3%)	1.00	1970, 2375			1.00	2588, 2214
Good	73.3% (71.0%–75.5%)	.98 (.83–1.16)	35.9% (33.8%–38.0%)	.87 (.76–.98)	1862, 2239			.88 (.76–1.01)	2513, 2198
Fair	72.4% (67.5%–76.8%)	.94 (.72–1.22)	33.5% (29.8%–37.3%)	.78 (.64–.94)	475, 551			.85 (.69–1.06)	759, 616
Bad/very bad	56.4% (45.2%–67.1%)	.46 (.29–.74)	24.5% (17.6%–33.2%)	.50 (.33–.78)	102, 115			.46 (.25–.83)	139, 103
Smoking status		ns		<i>p</i> = .0074				ns	
Never	74.1% (71.9%–76.2%)	1.00	34.7% (32.7%–36.7%)	1.00	1989, 2399			1.00	2681, 2317
Ex-smoker	74.5% (72.0%–79.1%)	1.09 (.87–1.37)	39.5% (36.2%–42.9%)	1.23 (1.04–1.46)	678, 831			1.15 (.96–1.39)	988, 861
Light smoker	70.9% (64.5%–74.1%)	.85 (.70–1.04)	40.0% (37.1%–43.1%)	1.26 (1.08–1.47)	900, 1010			1.19 (1.00–1.41)	1315, 1110
Heavy smoker	70.3% (66.6%–73.7%)	.83 (.67–1.01)	35.5% (32.2%–38.9%)	1.04 (.87–1.23)	835, 1031			1.02 (.84–1.24)	1015, 844
Alcohol consumption ^b		<i>p</i> < .0001		<i>p</i> < .0001				<i>p</i> < .0001	
None	56.5% (51.2%–61.6%)	1.00	25.2% (22.5%–28.2%)	1.00	449, 516			1.00	1164, 963
Not more than recommended limit	73.9% (72.3%–75.5%)	2.18 (1.73–2.74)	38.6% (37.0%–40.2%)	1.86 (1.58–2.20)	3464, 4179			1.54 (1.27–1.86)	4236, 3665
More than recommended limit	80.9% (76.6%–84.6%)	3.26 (2.33–4.57)	45.8% (41.2%–50.5%)	2.51 (1.97–3.19)	491, 780			1.74 (1.32–2.28)	596, 502

^a Odds ratio (OR) adjusted for age, marital status, any children, ethnicity (coded white vs. other), social class, ever had homosexual sex, partner numbers in the last year.^b Recommended limit is defined as less than 15 units of alcohol per week for women and less than 22 units of alcohol per week for men.

Table 5 Selected factors relating to current/recent sexual behavior and their association with reporting masturbation in the last 4 weeks by gender

	Men			Women			Denominator (unweighted/weighted)
	Prevalence% (95% CI)	Crude OR (95% CI)	Adjusted OR ^a (95% CI)	Prevalence% (95% CI)	Crude OR (95% CI)	Adjusted OR ^a (95% CI)	
All	73.0% (71.5%–74.4%)	<i>p</i> < .0001	<i>p</i> < .0001	36.8% (35.4%–38.2%)	<i>p</i> < .0001	<i>p</i> = .0003	5999, 5132
Number of occasions of sex, last 4 weeks ^b							
< 4	77.5% (75.5%–79.5%)	1.00	1.00	33.8% (31.9%–35.9%)	1.00	1.00	2773, 2210
4–7	68.4% (64.9%–71.7%)	.63 (.52–.76)	.66 (.52–.82)	36.1% (33.3%–39.0%)	1.10 (.95–1.29)	1.10 (.93–1.31)	1345, 1222
8–11	67.6% (63.3%–71.5%)	.60 (.48–.75)	.59 (.46–.76)	36.4% (33.0%–40.0%)	1.12 (.94–1.34)	1.10 (.90–1.34)	858, 779
12–15	67.3% (61.4%–72.7%)	.60 (.45–.79)	.55 (.40–.76)	43.4% (38.6%–48.4%)	1.50 (1.21–1.87)	1.53 (1.19–1.96)	466, 437
16 +	70.0% (64.4%–75.1%)	.68 (.51–.90)	.58 (.42–.79)	47.2% (41.6%–52.8%)	1.75 (1.37–2.23)	1.67 (1.27–2.19)	383, 349
Vaginal sex, last 4 weeks							
No	80.8% (78.1%–83.2%)	<i>p</i> < .0001	<i>p</i> < .0001	34.2% (31.4%–37.0%)	1.00	1.00	1415, 1053
Yes	70.5% (68.8%–72.2%)	.57 (.47–.68)	.59 (.46–.76)	37.8% (36.2%–39.3%)	1.17 (1.01–1.35)	1.14 (.94–1.38)	4486, 4006
Oral sex, last 4 weeks ^b							
No	71.5% (69.1%–73.8%)	1.00	1.00	27.4% (25.6%–29.2%)	1.00	1.00	2808, 2269
Yes	74.0% (72.0%–75.8%)	1.13 (.97–1.32)	1.04 (.87–1.24)	44.3% (42.4%–46.2%)	2.11 (1.87–2.38)	1.92 (1.67–2.21)	3191, 2863
Anal sex, last 4 weeks ^b							
No	72.7% (71.2%–74.2%)	1.00	1.00	36.0% (34.6%–37.4%)	1.00	1.00	5651, 4849
Yes	77.4% (70.9%–83.3%)	1.31 (.91–1.89)	1.17 (.75–1.82)	57.9% (50.9%–64.5%)	2.44 (1.84–3.26)	2.33 (1.68–3.23)	261, 222
Other genital contact, last 4 weeks ^b							
No	71.6% (69.3%–73.8%)	1.00	1.00	28.9% (27.1%–30.7%)	1.00	1.00	2865, 2281
Yes	74.0% (72.0%–75.8%)	1.13 (.97–1.31)	1.11 (.94–1.33)	43.1% (41.2%–45.0%)	1.87 (1.66–2.10)	1.77 (1.55–2.03)	3134, 2851
“Unsafe sex,” last 4 weeks ^{b,c}							
No	70.0% (68.1%–71.8%)	<i>p</i> < .0001	1.00	36.7% (35.1%–38.3%)	1.00	1.00	4168, 3780
Yes	79.2% (75.2%–82.7%)	1.63 (1.28–2.08)	1.40 (.93–2.09)	49.9% (45.1%–54.7%)	1.72 (1.40–2.11)	.91 (.59–1.41)	554, 429
Numbers of partners, last year ^b							
0	75.2% (69.3%–80.2%)	1.00	1.00	27.8% (23.7%–32.3%)	1.00	1.00	485, 327
1	71.0% (69.1%–72.8%)	.81 (.60–1.10)	.89 (.61–1.29)	35.5% (33.9%–37.1%)	1.43 (1.14–1.79)	1.55 (1.19–2.03)	4453, 3971
2	78.3% (73.8%–82.3%)	1.20 (.81–1.75)	1.05 (.68–1.63)	46.6% (41.8%–51.5%)	2.27 (1.70–3.03)	1.99 (1.46–2.71)	544, 412
3–4	76.4% (71.1%–81.0%)	1.07 (.72–1.59)	.99 (.63–1.56)	54.2% (46.7%–61.5%)	3.07 (2.11–4.47)	3.21 (2.14–4.81)	245, 195
5+	82.7% (77.5%–86.9%)	1.58 (1.02–2.47)	1.28 (.79–2.07)	58.5% (48.4%–67.9%)	3.66 (2.30–5.82)	3.03 (1.81–5.06)	127, 106
Duration of most recent partnership ^b							
Most recent occasion was also first occasion	76.9% (73.2%–80.3%)	1.00	1.00	33.9% (29.7%–38.5%)	1.00	1.00	589, 490
Less than 6 months	79.2% (74.2%–83.4%)	1.14 (.81–1.61)	.81 (.55–1.18)	45.7% (40.1%–51.4%)	1.64 (1.22–2.20)	1.31 (.93–1.84)	406, 313
At least 6 months but less than 12 months	75.0% (68.3%–80.6%)	.90 (.61–1.31)	.66 (.42–1.02)	42.3% (36.1%–48.8%)	1.43 (1.02–1.99)	1.36 (.93–1.99)	320, 256
At least 1 year but less than 3 years	76.0% (71.8%–79.8%)	.95 (.71–1.28)	.77 (.55–1.09)	44.2% (40.2%–48.3%)	1.54 (1.20–1.99)	1.52 (1.13–2.04)	808, 675
At least 3 years but less than 5 years	73.3% (67.9%–78.2%)	.82 (.59–1.15)	.80 (.54–1.18)	42.7% (38.1%–47.4%)	1.45 (1.10–1.91)	1.38 (1.01–1.90)	529, 442
At least 5 years but less than 10 years	74.5% (70.1%–78.4%)	.87 (.65–1.17)	.96 (.65–1.40)	36.9% (33.6%–40.3%)	1.14 (.87–1.45)	1.13 (.84–1.52)	897, 775
At least 10 years	66.3% (62.4%–70.0%)	.59 (.45–.77)	.76 (.51–1.12)	33.9% (31.2%–36.8%)	1.00 (.79–1.26)	1.13 (.84–1.52)	1262, 1161

^a Odds ratio (OR) adjusted for age, marital status, any children, ethnicity (coded white vs. other), social class, ever had homosexual sex, partner numbers in the last year.^b Heterosexual/homosexual.^c Defined as reporting two or more heterosexual and/or homosexual partners in the last year and inconsistent condom use in the last 4 weeks.

Table 6 Sexual function “problems” experienced for at least one month in the last year and their association with reporting masturbation in the last 4 weeks by gender

	Men		Women		Denominator (unweighted/weighted)		Denominator (unweighted/weighted)	
	Prevalence% (95% CI)	Crude OR (95% CI)	Prevalence% (95% CI)	Crude OR (95% CI)	Adjusted OR ^a (95% CI)	Adjusted OR ^a (95% CI)	Adjusted OR ^a (95% CI)	Adjusted OR ^a (95% CI)
All	73.0% (71.5%–74.4%)		36.8% (35.4%–38.2%)		4410, 5281		5999, 5132	
At least one sexual function “problem(s)” ^b		<i>p</i> < .0001		<i>p</i> = .001		<i>p</i> = .004		<i>p</i> = .004
No	69.1% (67.1%–71.0%)	1.00	35.2% (33.2%–37.3%)	1.00	2483, 3105		2890, 2462	
Yes	80.2% (77.7%–82.5%)	1.81 (1.52–2.16)	40.0% (38.0%–42.0%)	1.22 (1.09–1.38)	1436, 1699		3106, 2668	1.21 (1.06–1.38)
Lack of interest in sex ^b		<i>p</i> < .0001		ns				ns
No	71.5% (69.7%–73.2%)	1.00	37.7% (35.9%–39.6%)	1.00	3205, 3959		3190, 2771	1.00
Yes	80.4% (76.9%–83.5%)	1.64 (1.31–2.05)	37.8% (35.6%–40.1%)	1.01 (.89–1.14)	711, 841		2170, 1906	1.03 (.90–1.17)
Anxiety about performance ^b		<i>p</i> < .0001		<i>p</i> < .0001		<i>p</i> = .018		<i>p</i> = .018
No	71.7% (70.1%–73.3%)	1.00	37.0% (35.5%–38.5%)	1.00	3520, 4352		5005, 4364	1.00
Yes	85.8% (81.3%–89.3%)	2.37 (1.70–3.32)	47.8% (41.9%–53.7%)	1.56 (1.22–1.99)	396, 448		355, 312	1.38 (1.06–1.81)
Unable to experience orgasm ^b		<i>p</i> < .0001		<i>p</i> < .0001		<i>p</i> < .0001		<i>p</i> < .0001
No	72.3% (70.7%–73.9%)	1.00	36.1% (34.6%–37.6%)	1.00	3670, 4539		4565, 4007	1.00
Yes	85.5% (80.0%–89.8%)	2.26 (1.52–3.38)	47.6% (43.8%–51.6%)	1.61 (1.36–1.91)	246, 223		795, 669	1.47 (1.22–1.76)
Premature orgasm ^b		<i>p</i> = .009		ns				ns
No	72.3% (70.6%–73.9%)	1.00	37.6% (36.2%–39.1%)	1.00	3470, 4234		5292, 4617	1.00
Yes	78.8% (74.3%–82.7%)	1.43 (1.09–1.86)	45.8% (32.7%–59.6%)	1.40 (.80–2.45)	446, 566		68, 60	1.24 (.70–2.20)
Painful intercourse ^b		ns		ns				ns
No	72.9% (71.4%–74.4%)	1.00	37.4% (35.9%–38.9%)	1.00	3839, 4711		4754, 4120	1.00
Yes	79.0% (67.5%–87.2%)	1.40 (0.77–2.54)	40.4% (36.1%–44.9%)	1.14 (.93–1.38)	77, 88		606, 556	1.02 (.83–1.26)
Unable to achieve or maintain erection ^b		<i>p</i> = .002		na			na	na
No	72.4% (70.8%–74.0%)	1.00	na	na	3648, 4510		na	na
Yes	83.1% (76.9%–87.9%)	1.88 (1.26–2.80)	na	na	268, 290		na	na
Trouble lubricating ^b		na		<i>p</i> < .0001		<i>p</i> < .0001		<i>p</i> < .0001
No	na	na	36.3% (34.8%–37.8%)	1.00	na		4861, 4243	1.00
Yes	na	na	52.1% (47.1%–57.0%)	1.91 (1.55–2.35)	na		499, 433	1.61 (1.29–2.02)

^a Odds ratio (OR) adjusted for age, marital status, any children, ethnicity (coded white vs. other), social class, ever had homosexual sex, partner numbers in the last year.

^b Among those reporting at least one heterosexual and/or homosexual partner in the last year.

Factors relating to current/recent sexual attitudes

A larger proportion of participants who were considered as having relatively liberal attitudes about sex and sexual relations (see Table 7 for definition) reported masturbation (AOR of 1.66 for both men and women). Participants who said that they found it difficult to talk to their sexual partner(s) about sex were significantly less likely to report masturbation than those who did not report this difficulty. Regarding satisfaction with their current level of sexual activity, among those who reported sex in the last year, men and women who said that the amount of sex they were having was “about right” or that they would like sex “less often” were significantly less likely to report masturbation, even after adjustment than those who would like sex “much” or “a bit” more often. In terms of enjoyment of sex, men who said that they “always enjoy it” were significantly less likely to report masturbation than men who said “I enjoy it most of the time,” “I don’t often enjoy it” or “I never enjoy it.” No such association was observed for women.

Discussion

In this large, nationally representative sample of adults in Britain, masturbation was relatively common but the gender difference in prevalence was striking, with 28.8% of women, but only 5.4% of men reporting that they had never masturbated. Although reported rates of masturbation in different studies vary widely, our findings with regard to factors associated with masturbation were broadly consonant with those from other studies.

Reporting masturbation was most common among those aged 25–34 years, the better educated, and those who reported a “white” ethnicity. These findings were consistent with previous national surveys in the U.S. and France (Laumann et al., 1994; Spira et al., 1994). The positive associations between reporting masturbation and any previous homosexual experiences, as well as between reporting masturbation and an earlier age at first sex (among women only) confirmed findings reported on a Finnish sample (Kontula & Haavio-Mannila, 2002). The significant increase in reported masturbation among both men and women as level of education and social class increased supports associations reported in other national surveys. These associations have been attributed to greater access to public debate, to information, and to sex education, which may help reduce fears and guilt (Kontula & Haavio-Mannila, 2002), and increased willingness to report masturbation.

The inverse association among women between reporting masturbation and stronger religious beliefs mirrors findings from the French national survey (Spira et al., 1994). Kinsey et al. (1953) also noted that “devoutness” rather than

religious affiliation was related to a reduced likelihood of masturbation, particularly for women.

There were some limitations to our study. We asked only one question—about the last occasion of masturbation—in the Natsal 2000 survey. We have no information on the frequency of masturbation or on attitudes towards masturbation. Further, despite the use of a computer assisted technique of interviewing found to be more reliable for reporting sensitive behaviors than face-to-face data collection techniques or pen and paper methods (Johnson et al., 2001; Johnson, Wadsworth, Wellings, Bradshaw, & Field, 1992; Johnson, Wadsworth, Wellings, & Field, 1994), sensitive sexual behaviors, such as masturbation, may still be under-reported in sexual health surveys (Copas et al., 2002). Despite the relatively high reported prevalence of masturbation in Natsal 2000, it is a solitary sex act that remains somewhat stigmatized, is not discussed as openly as other sexual activities, and is associated with guilt and myths (Cardamakis et al., 1993; Coleman, 2002; Kitamura, 1990). It is, therefore, possible that social acceptability bias led to some under-reporting in Natsal 2000. Female under-reporting was clearly identified in the 1993 French sexual behavior survey (Béjin, 1996), which may explain some of the gender gap observed in the Natsal 2000 data, but is unlikely to account for such a large and consistent difference.

The differential reporting between men and women was entirely consistent with findings from large-scale national surveys carried out in other countries (Kontula & Haavio-Mannila, 2002; Laumann et al., 1994; Oliver & Hyde, 1993; Spira et al., 1994). While gender differences in other sexual behaviors have diminished, with respect to masturbation they remain substantial (Hyde, 2005). Various explanations have been put forward for this, including differences in anatomy and in sexual development (Béjin, 1996). Furthermore, boys may be more socialized to masturbate by their peers than girls (Kontula & Haavio-Mannila, 2002; Laumann et al., 1994). Some have argued that differential rates of masturbation may reflect a gender difference in sex drive and sexual fantasizing, with women having a lower sex drive than men (Baumeister, Catanese, & Vohs, 2001), and men more likely to report sexual fantasies (Leitenberg & Henning, 1995). Men are also more likely to report becoming aroused by their fantasies (Ellis & Symons, 1990) and to fantasize during masturbation (Leitenberg & Henning, 1995).

During the developmental qualitative study for the first Natsal survey, Spencer et al. (1988) found that people associated masturbation with males, particularly adolescent boys, and that it was viewed as a substitute for intercourse with a partner. Interviewers suspected these views led to some under-reporting of masturbation. The data presented here do not support the idea that masturbation was a substitute for partnered sex, at least for women. On the contrary, among women, reporting masturbation was associated with

Table 7 Selected factors relating to current/recent sexual attitudes and their association with reporting masturbation in the last 4 weeks, by gender

	Men		Women		Denominator (unweighted/weighted)	Denominator (unweighted/weighted)
	Prevalence% (95% CI)	Crude OR (95% CI)	Prevalence% (95% CI)	Crude OR (95% CI)		
All	73.0% (71.5%–74.4%)	$p < .0001$	36.8% (35.4%–38.2%)	$p < .0001$	4410, 5281	5999, 5132
Liberal attitudes towards sex/sexual relations ^b						
No	71.3% (69.6%–72.8%)	1.00	35.3% (33.9%–36.7%)	1.00	3802, 4601	5432, 4679
Yes	84.6% (81.0%–87.6%)	2.21 (1.70–2.87)	52.2% (47.5%–56.9%)	2.00 (1.64–2.44)	608, 680	567, 453
Find it difficult to talk about sex with partner(s) ^c						
No	76.2% (73.8%–78.4%)	1.00	45.5% (42.3%–48.9%)	1.00	1656, 1885	1141, 941
Yes	71.2% (69.3%–73.0%)	.77 (.66–.91)	34.8% (33.4%–36.3%)	.64 (.55–.74)	2754, 3396	4858, 4191
Satisfaction with amount of sex ^d						
Would like sex “much/a bit more often”	81.9% (80.0%–83.7%)	1.00	45.5% (43.2%–47.9%)	1.00	2035, 2452	2207, 1833
“About right”	64.2% (61.8%–66.6%)	.40 (.34–.47)	33.1% (31.2%–35.0%)	.59 (.52–.67)	1831, 2296	2986, 2701
Would like sex “less often”	45.9% (30.9%–61.7%)	.19 (.10–.36)	28.2% (21.0%–36.6%)	.47 (.32–.70)	50, 50	165, 142
Enjoyment of sex ^d						
“When I have sex these days I always enjoy it”	70.2% (68.1%–72.3%)	1.00	38.0% (35.7%–40.4%)	1.00	2228, 2821	2007, 1753
“When I have sex these days I enjoy it most of the time/I don’t often enjoy it/I never enjoy it”	76.8% (74.4%–78.9%)	1.40 (1.19–1.64)	37.5% (35.6%–39.4%)	.98 (.86–1.11)	1623, 1913	3159, 2784

^a Odds ratio (OR) adjusted for age, marital status, any children, ethnicity (coded white vs. other), social class, ever had homosexual sex, partner numbers in the last year.

^b Defined as reporting that pre-marital sex, one-night stands, sexual relations between two adult men, and sexual relations between two adult women are all “not wrong at all.”

^c The corresponding question was worded “Some people who have sex together find it easy to talk openly about it, others find it difficult to talk openly about it – for example to tell each other what they like and dislike in sex. What about you, how easy or difficult would it be for you?” Those who reported: “Easy with a husband, wife or regular partner, but difficult with a new partner;” “Easy with a new partner, but difficult with a husband, wife or regular partner;” or “Difficult with any partner” were coded as Yes for this dichotomous variable.

^d Among those reporting at least one heterosexual and/or homosexual partner in the last year.

reporting more frequent sexual activity as well as more sexual partners. Furthermore, women reporting a wide range of sexual practices and/or reporting being comfortable discussing sex with their partners were also more likely to report masturbating in the last four weeks. In contrast, among men, those reporting vaginal sex in the last four weeks were less likely to report masturbation than those who reported no vaginal sex. Also, for men only, the likelihood of masturbation decreased with increasing frequency of partnered sex and increased among those who reported less enjoyment in sex with a current partner.

As a broad generalization, it is difficult to avoid the conclusion that masturbation for many predominantly heterosexual men may represent a substitute for vaginal sex, while for women the practice appears to be part of the wider repertoire of sexual fulfilment, supplementing, rather than compensating for, partnered sex among women. Some women may be more sexually adventurous and more interested in sex, and this phenomenon may be reappearing in the context of masturbation. It is not clear what factors might be driving these gender differences. Baumeister's (2000) hypothesis that women have greater "erotic plasticity" may be relevant here. If women's sex drive is more malleable than men's, it may be more dependent on their current sexual situation and level of stimulation. Thus, when a woman is more sexually active, her sex drive (including her desire for masturbation) may be higher as a result. Although other studies have described associations between masturbation and other sexual activities, there have been few reports of gender differences in this respect. Laumann et al. (1994), for example, found that both women and men with higher levels of "autoeroticism" (a composite variable comprised of masturbation, sexual fantasy, and use of erotica materials) were more likely to engage in oral and/or anal sex and to have multiple partners.

Kinsey's view of masturbation as one of several "outlets" resulting in orgasm may prove more relevant for women than men. Women who are more sexual and comfortable with their sexuality may masturbate more because they are more likely to climax during masturbation than during intercourse. A study that asked men and women in steady relationships to describe their last intercourse and last masturbation found that, although more men and women reported reaching orgasm through masturbation than through intercourse, the difference was small among men but substantial among women (Dekker & Schmidt, 2002). Although the Natsal 2000 study did not ask participants about frequency or context of orgasm, those reporting inability to experience orgasm were more likely to report masturbation, but we did not find any significant gender differences in this respect.

This study provided an initial exploration of the factors associated with reporting masturbation in a large national probability sample of the British population, which we hope will encourage further investigation into a common sexual

act that provides pleasure without the risks that place sexual health on the public health agenda. Proponents of masturbation as a means of enhancing sexual health have called for research on masturbation that goes beyond asking whether, and how often, people masturbate, and to what extent guilt is experienced (Coleman, 2002). Understanding gendered patterns with regard to the possible function sexual practices may serve is important in the context of attempts to harness such sexual activities to public health and preventive goals.

Acknowledgments We would like to thank the study participants and the team of interviewers, operations, and computing staff from the National Centre for Social Research. The 2000 National Survey of Sexual Attitudes and Lifestyles (Natsal 2000) was supported by a grant from the Medical Research Council with funds from the Department of Health, the Scottish Executive and the National Assembly for Wales. The views expressed in this paper are the authors and do not necessarily reflect the views of the funding bodies.

References

- Barbey, M. A. (1991). Switzerland's videotext computer sex education programme. *Planned Parenthood in Europe*, 20, 22–23.
- Baumeister, R. F. (2000). Gender differences in erotic plasticity: The female sex drive as socially flexible and responsive. *Psychological Bulletin*, 126, 347–374.
- Baumeister, R. F., Catanese, K. R., & Vohs, K. D. (2001). Is there a gender difference in strength of sex drive? Theoretical views, conceptual distinctions, and a review of relevant evidence. *Personality and Social Psychology Review*, 5, 242–273.
- Béjin, A. (1996). Female masturbation in France: Estimation and analysis of an under-reported practice. In M. Bozon & H. Leridon (Eds), *Sexuality and the social sciences: A French survey on sexual behaviour* (pp. 253–264). Dartmouth: Aldershot.
- Bullough, V. L. (2002). Masturbation: A historical overview. *Journal of Psychology and Human Sexuality*, 14, 17–33.
- Cardamakis, E., Vinakos, G., Lambou, T., & Papatathanasiou, Z. (1993). Comments by the "Information by Phone" department of the Sex Medical Institute on the telephone calls related to sexuality and contraception. *European Journal of Obstetrics, Gynecology, and Reproductive Biology*, 52, 125–129.
- Coleman, E. (2002). Masturbation as a means of achieving sexual health. *Journal of Psychology and Human Sexuality*, 14, 5–16.
- Copas, A. J., Wellings, K., Erens, B., Mercer, C. H., McManus, S., Fenton, K. A., et al. (2002). The accuracy of reported sensitive sexual behaviour in Britain: Exploring the extent of change 1990–2000. *Sexually Transmitted Infections*, 78, 26–30.
- Darby, R. (2003). The masturbation taboo and the rise of routine male circumcision: A review of the historiography. *Journal of Social History*, 36, 737–757.
- Dekker, A., & Schmidt G. (2002). Patterns of masturbatory behaviour: Changes between the sixties and the nineties. *Journal of Psychology and Human Sexuality*, 14, 35–48.
- Editorial. (1994). The politics of masturbation. *Lancet*, 344, 1714–1715.
- Ellis, B. J., & Symons, D. (1990). Sex differences in sexual fantasy: An evolutionary psychological approach. *Journal of Sex Research*, 27, 527–56.
- Erens, B., McManus, S., Field, J., Korovessis, C., Johnson, A. M., Fenton, K. A., et al. (2001). *National survey of sexual attitudes and lifestyles II: Technical report*. London: National Centre for Social Research.

- Fenton, K. A., Mercer, C. H., McManus, S., Erens, B., Wellings, K., Maccowall, W., et al. (2005). Ethnic variations in sexual behaviour in Great Britain and risk of sexually transmitted infections: A probability survey. *Lancet*, *365*, 1246–1255.
- Heiman, D. R., & LoPiccolo, J. (1988). *Becoming orgasmic: A sexual and personal growth program for women*. New York: Simon & Schuster.
- Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist*, *60*, 581–592.
- International Planned Parenthood Federation (IPPF), Office for East, South East Asia and Oceania Region (ESEAOR). (1996). Teenagers' concerns about sex. *People and Development Challenges*, *3*, 11–12.
- Johnson, A. M., Copas, A. J., Erens, B., Mandalia, S., Fenton, K., Korovessis, C., et al. (2001). Effect of computer-assisted self-interviews on reporting of sexual HIV risk behaviours in a general population sample: A methodological experiment. *AIDS*, *15*, 111–115.
- Johnson, A. M., Mercer, C. H., Erens, B., Copas, A. J., McManus, S., Wellings, K., et al. (2001). Sexual behaviour in Britain: Partnerships, practices, and HIV risk behaviours. *Lancet*, *358*, 1835–1842.
- Johnson, A. M., Wadsworth, J., Wellings, K., Bradshaw, S., & Field, J. (1992). Sexual lifestyles and HIV risk. *Nature*, *360*, 410–412.
- Johnson, A. M., Wadsworth, J., Wellings, K., & Field, J. (1994). *Sexual attitudes and lifestyles*. Oxford: Blackwell Scientific Press.
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. Philadelphia: Saunders.
- Kinsey, A. C., Pomeroy, W. B., Martin, C. E., & Gebhard, P. H. (1953). *Sexual behavior in the human female*. Philadelphia: Saunders.
- Kitamura, K. (1990). Communicating with adolescents. Telephone counselling and adolescent health clinic services of the Japan Family Planning Association. *Integration* *25*, 40–41.
- Kontula, O., & Haavio-Mannila, E. (2002). Masturbation in a generational perspective. *Journal of Psychology and Human Sexuality*, *14*, 49–83.
- Kuriansky, J. (1996). Sexuality advice on the radio: An overview in the United States and around the world. *SIECUS Report*, *24*, 6–9.
- Laqueur, T. W. (2003). *Solitary sex: A cultural history of masturbation*. New York: Zone Books.
- Laumann, E. O., Gagnon, J. H., Michael, R. T., & Michaels, S. (1994). *The social organization of sexuality: Sexual practices in the United States*. Chicago: University of Chicago Press.
- Leitenberg, H., & Henning, K. (1995). Sexual fantasy. *Psychological Bulletin*, *117*, 469–496.
- Lynn P., & Clarke P. (2002). Separating refusal bias and non-contact bias: Evidence from UK national surveys. *The Statistician*, *51*, 319–333.
- Mercer, C. H., Fenton, K. A., Johnson, A. M., Copas, A. J., Wellings, K., Maccowall, W., et al. (2003). Sexual function problems and help seeking behaviour in Britain: National probability sample survey. *British Medical Journal*, *327*, 426–427.
- Oliver, M. B., & Hyde, J. S. (1993). Gender differences in sexuality: A meta-analysis. *Psychological Bulletin*, *114*, 29–51.
- Pinkerton, S. D., Bogart, L. M., Cecil, H., & Abramson, P. R. (2002). Factors associated with masturbation in a collegiate sample. *Journal of Psychology and Human Sexuality*, *14*, 103–121.
- Robinson, B. E., Bockting, W. O., & Harrell, T. (2002). Masturbation and sexual health: An exploratory study of low income African American women. *Journal of Psychology and Human Sexuality*, *14*, 85–101.
- Royal College of Physicians, Psychiatrists and General Practitioners. (1995). *Alcohol and the heart in perspective: Sensible limits reaffirmed*. London: Royal College of Physicians, Psychiatrists and General Practitioners.
- Spencer, L. A., Faulkner, A., & Keegan, J. (1988). *Talking about sex*. London: Social and Community Planning Research.
- Spira, A., Bajos, N., & ACSF Group. (1994). *Sexual behaviour and AIDS*. Aldershot: Avebury.
- Wellings, K., Nanchahal, K., Maccowall, W., McManus, S., Erens, B., Mercer, C. H., et al. (2001). Sexual behaviour in Britain: Early heterosexual experience. *Lancet*, *358*, 1843–1850.
- Zamboni, B. D., & Crawford, I. (2002). Using masturbation in sex therapy: Relationships between masturbation, sexual desire, and sexual fantasy. *Journal of Psychology and Human Sexuality*, *14*, 123–141.