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Are sexual problems more common in women who have had a tubal ligation? A population-based study of Australian women

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Objective To investigate whether women who have had a tubal ligation are more likely to experience sexual problems than other women.

Design Population-based telephone survey.

Setting Australia-wide, including cities, regional towns, and rural areas.

Population A total of 3448 Australian women aged between 16 and 64 years.

Methods Women were surveyed using random-digit dialling throughout 2004 and 2005.

Main outcome measures Prevalence of sexual problems and ratings of sexual satisfaction, relationship satisfaction, and sexual pleasure.

Results From a weighted sample of 2721 women, 447 (16.4%) reported having had a tubal ligation, with 85.0% currently aged between 40 and 64 years. Having a tubal ligation was not associated with any specific sexual problem, such as physical pain during sex or an inability to reach orgasm. In fact, after controlling for age and other sociodemographic differences, sterilised women were significantly less likely than non-sterilised women to lack an interest in having sex (OR 0.69, 95% CI 0.54–0.89), to take 'too long' to reach orgasm (OR 0.69, 95% CI 0.50–0.96), to experience vaginal dryness during sex (OR 0.70, 95% CI 0.50–0.96), and to find sex unpleasurable (OR 0.64, 95% CI 0.46–0.90). Sterilised women were also more likely to experience extremely high levels of sexual satisfaction (OR 1.66, 95% CI 1.27–2.18), relationship satisfaction (OR 1.29, 95% CI 1.01–1.67), and sexual pleasure (OR 1.59, 95% CI 1.20–2.12).

Conclusions Our findings suggest no adverse effects, and possibly some benefits, for the sexual lives of women undergoing tubal ligation. These findings should be included with other educational material for couples considering sterilisation as a contraception option.

Keywords Relationship satisfaction, sexual problems, sexual satisfaction, tubal ligation, women.

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Introduction

Heterosexual couples seeking permanent contraception can face a difficult decision choosing either male or female sterilisation. Although tubal ligations are more popular than vasectomies in the majority of developed countries,[1] this is not the case in such countries as the UK[2] and New Zealand.[3] Even in Australia, the rate of vasectomies compared with tubal ligations has increased over recent decades.[4–6]

Tubal ligation has a longer recovery time, tends to be less safe, and is not as cost-effective as a vasectomy,[7] so it is perhaps unsurprising that couples in some countries are favouring male sterilisation. Recent research also reveals that, regardless of cultural differences, couples tend to believe that vasectomies are safer and have fewer negative health effects than tubal ligations.[8] Although the vast majority of women report satisfaction with their decision to undergo tubal sterilisation,[9,10] a recent Turkish study[10] found 30% experienced changes in their menstrual cycle, 35% had lower abdominal pain, and 23.1% reported changes in their sexual relationships. Studies conducted in other countries have also found between 5.9% and 20.3%

of women who have had a tubal ligation express regret over their decision to be sterilised, particularly among those who were sterilised at a younger age.[11–13]

For these reasons, it is essential that women considering tubal ligation are fully informed by general practitioners and other relevant health-service providers of all possible health and psychological outcomes of sterilisation. Such information also needs to include potential sexual outcomes of tubal ligation. Unfortunately, only a few studies have examined whether women experience changes in their sexual response following a tubal ligation.[14–16] Focusing predominantly on ratings of overall sexual satisfaction, these studies showed that, apart from a small minority of women, most experience no decline in satisfaction. In fact, there are some instances where women who have had a tubal ligation experience improvements. For example, research conducted among Hong Kong Chinese women[17] found an increase in both sexual satisfaction and sexual drive following sterilisation. The authors suggested that sterilised women were less anxious about having an unwanted pregnancy and therefore felt less inhibited sexually.

However, none of these studies examined whether the prevalence of particular sexual problems, such as pain during sex or an inability to reach orgasm, vary between sterilised and non-sterilised women. Although a recent US study[18] found that women who had a tubal ligation were more likely than non-sterilised women to seek advice from a physician regarding sexual problems, it is not known what types of sexual problems these women experienced, or whether their tendency to seek advice reflected a greater incidence of sexual problems or simply heightened vigilance following sterilisation.

Given the current lack of information on sexual outcomes of tubal ligation, a more detailed, population-based investigation is required. Using a large, representative sample of sexually active, heterosexual Australian women currently in a regular relationship, the present study investigated the prevalence of sexual problems among those who had a tubal ligation and those who had not been sterilised, including their overall sexual and relationship satisfaction. Of the 70.8% of Australian women who report using contraception, almost a quarter (22.5%) have undergone either tubal ligation or a hysterectomy.[5] Despite this, no comprehensive population-based investigation has yet been conducted into Australian women's sexual and relationship satisfaction. For this reason, the present study also examined the sociodemographic correlates of women who underwent tubal ligation.

Methods

Recruitment

The present study was a component of the Australian Longitudinal Study of Health and Relationships (ALSHR).[19] Although the ALSHR surveyed 4290 men and 4366 women in all states and territories of Australia, only women who were identified as heterosexual, were sexually active, and in a regular relationship were included in the present study. This amounted to 3448 respondents aged between 16 and 64 years, with a mean age of 41.7 years.

Survey

Women were first asked a range of sociodemographic questions, including age, education, occupation, country of birth, household income, residential location (categorised for this analysis as city, regional, or remote), language spoken at home, length of relationship, marital status, and cohabitation status (living together versus living separately). Women were then asked if they had ever had a tubal ligation. Initially, the interviewer asked, 'Have you had a tubal ligation?', and if women were unfamiliar with this term, the interviewer then asked whether they had had their 'tubes tied'. Following this, women rated their overall levels of sexual and relationship satisfaction with their current regular partner by selecting one of five categories: not at all satisfied, slightly, moderately, very, and extremely satisfied. Using another five categories, ranging from not at all pleasurable to extremely pleasurable, women also rated the degree to which they found sex with their partner pleasurable. Finally, all women were presented with eight sexual problems and were asked whether they had experienced each problem for at least 1 month during the previous 12 months. These were a lack of interest in having sex, inability to reach orgasm, reaching orgasm too quickly, taking too long to reach orgasm, physical pain during sex, not finding sex pleasurable, anxiety over sexual performance, and vaginal dryness during sex.

Procedure

Approval for this study was granted by the human research ethics committees of La Trobe University, the University of New South Wales, and Deakin University, and was conducted during 2004 and 2005 using computer-assisted telephone interviewing. Women were first contacted through random-digit dialling, and, after having the study explained to them, either gave their verbal consent to be interviewed or refused. There were no financial or other incentives offered for participation. Of those contacted, 55.0% agreed to participate. Age was the only selection criterion used (between 16 and 64 years). Where two or more eligible respondents lived in a household, one was randomly chosen to be interviewed. All interviews were conducted in English.

Statistical analysis

Using logistic regression and chi-square analyses, we assessed the sociodemographic correlates of having a tubal

ligation. Given the survey design methodology, design-based F statistics for these analyses are reported (as F^*), to take into account design weights. Odds ratios and 95% confidence intervals were also computed to assess associations between having a tubal ligation and a range of sexual problems, as well as women's overall levels of sexual and relationship satisfaction, and their ratings of sexual pleasure. Adjustments to these models were subsequently made to account for sociodemographic differences between sterilised and non-sterilised women. All associations between variables were treated as statistically significant at the level of $P < 0.05$. These analyses were conducted using Stata 10.1 (StataCorp, College Station, TX, USA).

Results

Of women who had a tubal ligation, five (1.1%) reported having it reversed and were therefore excluded from the analyses. A further 630 women reported having had a hysterectomy or oophorectomy, but because this study was restricted to those who have had a tubal ligation, these women were also excluded from the analyses. Finally, some households had two or more eligible household members, so data from the respondent surveyed was used to represent them. The following results are therefore based on a weighted sample of 2721 women.

Sociodemographic profile of sterilised Australian women

Table 1 displays the numbers and percentages of women from each sociodemographic background who reported having had a tubal ligation (hereafter referred to as sterilised women). In all, 447 (16.4%) women, with a mean age of 49.4 years, were sterilised. Only one woman was aged under 30 years, whereas 380 (85.0%) were aged 40 years and above. Apart from being older, the women who were most likely to have had a tubal ligation were living outside major cities, had lower incomes, had poorer education levels, were either married or had once been married, were living with their current regular partner, and had been in their current relationship for more than 10 years (Table 1).

Logistic regression was used to assess whether each sociodemographic variable was significantly associated with having a tubal ligation, after controlling for differences in the other variables. Because only one woman under the age of 30 years reported having had a tubal ligation, this analysis and all subsequent analyses were confined to those aged 30 years and above. Age [$F^*(3, 4192) = 17.38$, $P < .001$], residential location [$F^*(2, 4193) = 3.00$, $P = 0.05$], education [$F^*(2, 4193) = 9.04$, $P < 0.001$], occupation [$F^*(3, 4192) = 3.54$, $P = 0.01$], country of birth [$F^*(1, 4194) = 3.95$, $P = 0.05$], and marital status [$F^*(2, 4193) = 2.96$, $P = 0.05$] were the only sociodemographic variables significantly associated with having a tubal ligation.

Sexual problems

Table 2 displays the odds ratios and percentages of women who had sex during the previous 12 months, and who reported experiencing each type of sexual problem for at

Table 1. Sociodemographic correlates of having had a tubal ligation (n = 2721)

	Had a tubal ligation?		Chi-square statistic
	No, *n* (%)	Yes, *n* (%)	
Age (years)			
16–19	93 (100)	0 (0)	$\chi^2_5 = 333.84$;
20–29	457 (99.8)	1 (0.2)	$P < 0.001$
30–39	662 (90.9)	66 (9.1)	
40–49	640 (81.2)	148 (18.8)	
50–59	348 (67.0)	171 (33.0)	
60–64	74 (55.0)	61 (45.0)	
Education			
Less than secondary	507 (72.1)	196 (27.9)	$\chi^2_2 = 105.89$;
Secondary	1099 (85.6)	184 (14.4)	$P < 0.001$
Post secondary	669 (91.1)	65 (8.9)	
Occupation			
Unskilled	425 (78.7)	115 (21.3)	$\chi^2_3 = 13.56$;
Tradesperson	104 (83.7)	20 (16.3)	$P = 0.009$
Associate professional	895 (84.0)	171 (16.0)	
Professional	811 (85.8)	134 (14.2)	
Country of birth			
Overseas	493 (84.1)	93 (15.9)	$\chi^2_1 = 0.47$;
Australia	1781 (83.2)	359 (16.8)	$P = 0.55$
Household income			
$60 000 or less	906 (80.2)	223 (19.8)	$\chi^2_1 = 15.60$;
$60 001 or more	1187 (86.0)	194 (14.0)	$P < 0.001$
Residential location			
Cities	1180 (86.0)	192 (14.0)	$\chi^2_2 = 13.52$;
Regional	964 (80.7)	230 (19.3)	$P = 0.002$
Remote	107 (84.7)	19 (15.3)	
Language spoken at home			
Non-English	90 (81.5)	20 (18.5)	$\chi^2_1 = 0.36$;
English	2185 (83.7)	427 (16.3)	$P = 0.66$
Length of relationship (years)			
≤2	350 (93.9)	23 (6.1)	$\chi^2_4 = 189.15$;
3–5	287 (93.1)	21 (6.9)	$P < 0.001$
6–10	353 (91.2)	34 (8.8)	
11–20	565 (87.7)	80 (12.3)	
>20	714 (71.4)	286 (28.6)	
Marital status			
Married	1552 (80.3)	381 (19.7)	$\chi^2_2 = 104.56$;
Never married	548 (97.4)	14 (2.6)	$P < 0.001$
Other (e.g. divorced)	174 (77.1)	52 (22.9)	
Cohabitation status			
Living together	1907 (82.2)	413 (17.8)	$\chi^2_1 = 22.66$;
Living separately	367 (91.6)	34 (8.4)	$P < 0.001$

Table 2. Association between having had a tubal ligation and reporting sexual problems for a period of 1 month or more during the previous 12 months (n = 2036)*

	Had a tubal ligation?		Unadjusted OR (95% CI)	Adjusted** OR (95% CI)
	No (%)	Yes (%)		
Lacked interest in having sex	51.2	42.4	0.70 (0.56–0.88)	0.69 (0.54–0.89)
Was unable to reach orgasm	20.7	20.5	0.98 (0.75–1.29)	0.83 (0.61–1.11)
Came to orgasm too quickly	5.4	5.0	0.93 (0.56–1.53)	0.85 (0.48–1.50)
Took too long to reach orgasm	20.4	16.5	0.77 (0.57–1.04)	0.69 (0.50–0.96)
Experienced physical pain during sex	9.5	7.0	0.72 (0.48–1.08)	0.76 (0.48–1.22)
Did not find sex pleasurable	17.3	13.9	0.77 (0.57–1.04)	0.64 (0.46–0.90)
Was anxious about sexual performance	10.6	10.6	0.99 (0.70–1.40)	1.18 (0.79–1.76)
Experienced vaginal dryness during sex	19.1	19.7	1.04 (0.79–1.37)	0.70 (0.50–0.96)

OR, odds ratio; CI, confidence interval.
*Some women did not answer these questions, which reduced the sample size for this analysis.
**Adjusted for significant sociodemographic differences between sterilised and non-sterilised women.

least 1 month during this period. Sterilised women were significantly less likely than non-sterilised women to lack an interest in having sex. Other differences were not statistically significant. However, after model adjustments were made to account for the significant sociodemographic differences found between the two groups of women, sterilised women were still significantly less likely to lack sexual interest than non-sterilised women, but were also significantly less likely to take too long to reach orgasm, were more likely to find sex pleasurable, and were slightly less likely to experience vaginal dryness during sex (Table 2).

Sexual and relationship satisfaction

Table 3 displays the odds ratios and percentages of women who had sex during the previous 12 months and reported extremely high levels of sexual satisfaction, relationship satisfaction, and sexual pleasure. Sterilised women were significantly more likely than non-sterilised women to express extremely high sexual satisfaction. After making model adjustments to account for significant sociodemographic differences between the two groups of women, sterilised women were even more likely than non-sterilised women to report extremely high levels of sexual satisfaction, and were also significantly more likely to experience extremely high levels of both sexual pleasure and relationship satisfaction (Table 3).

Discussion

Based on our sample of Australian women in heterosexual relationships, sexual problems are no more likely among women who have had a tubal ligation than they are among other women. In fact, after taking into account sociodemographic differences, sterilised women were less likely than non-sterilised women to lack interest in having sex, were more likely to find sex pleasurable, were less likely to take too long to reach orgasm, and were less likely to experience vaginal dryness during sex. So although a previous study found that sterilised women sought medical advice regarding sexual problems more often than other women,[18] we found no evidence that sexual problems are more prevalent among this group than among other women.

Table 3. Association between having had a tubal ligation and extremely high levels of sexual satisfaction, relationship satisfaction, and sexual pleasure (n = 2020)*

	Had a tubal ligation?		Unadjusted OR (95% CI)	Adjusted** OR (95% CI)
	No (%)	Yes (%)		
Extremely high sexual satisfaction	29.9	36.0	1.32 (1.04–1.68)	1.66 (1.27–2.18)
Extremely high relationship satisfaction	37.6	39.3	1.08 (0.86–1.35)	1.29 (1.01–1.67)
Extremely high sexual pleasure	26.3	29.4	1.16 (0.91–1.50)	1.59 (1.20–2.12)

OR, odds ratio; CI, confidence interval.
*Some women did not answer these questions, which reduced the sample size for this analysis.
**Adjusted for significant sociodemographic differences between sterilised and non-sterilised women.

Indeed, our findings point in the opposite direction. After controlling for sociodemographic differences, sterilised women were more likely than non-sterilised women to report extremely high levels of sexual and relationship satisfaction, and also sexual pleasure. As others have suggested,[17] some sterilised women may have found their sexual relationship more enjoyable if they were previously anxious about having an unwanted pregnancy, particularly if they were not using other forms of contraception prior to sterilisation. Their male partners may have also felt less inhibited after the procedure, so the chances of a mutually satisfying sexual relationship are perhaps greater following sterilisation, and therefore provide for greater relationship satisfaction. It is also possible that a small minority of women experienced decreased libido while using hormonal contraception,[20] and therefore found this issue was resolved following tubal ligation.

In addition, similar to studies conducted in other countries,[21,22] Australian women who have never been married or have a higher socio-economic background appear less likely to undergo tubal ligation than those who are married, who were ever married, or have a lower socio-economic background. We also found that women living in cities were less likely to opt for tubal ligation than those living in towns or more remote regions. Putting this together, women with higher education levels and living in urban areas are perhaps more likely than other women to delay having children, possibly with a focus on establishing a professional career, and are therefore less likely to seek permanent sterilisation.

There are, however, some limitations to the present study. First, some self-selection biases may have been present. For example, some women may have refused to participate if they felt embarrassed about discussing a sexual problem. Second, it is not known how many women who chose to have a tubal ligation already experienced high levels of sexual satisfaction pre-surgery. For example, women who have children and already feel satisfied and secure in their relationship may be more likely to seek tubal ligation than those who are less secure and perhaps want to retain their ability to have another child if they enter a new relationship. Third, we were unable to assess sexual outcomes for our respondents' male partners. Sometimes sterilisation regret is experienced by the non-sterilised partner.[23,24] Future research needs to investigate whether this group experience specific sexual problems following the sterilisation of their partner. Finally, a comparison between the psychosexual wellbeing of couples who choose tubal ligation versus a vasectomy would shed greater light on the relative advantages and disadvantages of the options facing couples seeking permanent contraception. Again, this is a subject requiring future research.

Conclusion

Despite the need for further investigation, the results of the present study indicate that sexual problems are no more prevalent among women who have had a tubal ligation than they are among other women, therefore making sexual outcomes an unlikely factor in post-sterilisation regret. This reassurance, however, needs to be weighed against the lower cost-effectiveness and other disadvantages of tubal ligation, compared with vasectomy and long-acting reversible contraception. How couples decide whether to proceed with male or female sterilisation is likely to be a complex process, and one that requires further study. In the meantime, it is essential that couples are given detailed information by health-service providers about all potential outcomes of tubal ligation, including sexual outcomes.

Disclosure of interests

None.

Contribution to authorship

AS, JR, MP, and JS designed the study. AS supervised the project. JF and AL analysed the data. AL wrote the manuscript and all authors contributed to the final draft. All authors approved the final version of this manuscript.

Details of ethics approval

This study was conducted as part of the ALSHR, which received ethics approval from La Trobe University (ref. no.: HEC03-101), the University of New South Wales (ref. no.: HREC 04196), and Deakin University (ref. no.: EC 28-2006).

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