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ORIGINAL PAPER

Patient sexual function and hip replacement surgery: A survey of surgeon attitudes

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Abstract
Purpose To explore practises of orthopaedic surgeons (and residents) in addressing sexual function (SF) in patients before and after total hip arthroplasty (THA).
Methods A 26-item questionnaire was sent to health professionals ($n = 849$); 526 (62.0%) responses were included in the analyses.
Results About 78% of the respondents (77.5%) almost never addressed SF. The most mentioned reason was that "patients do not ask" (47.4%) followed by "I am not aware of possible needs" (38.6%). SF was even less discussed (25.9%) in elderly patients (>60 years). The beneficial effect of THA on SF was rated the highest in retired surgeons ($p \leq 0.001$), in which male surgeons scored higher than female surgeons ($p = 0.002$). The importance of sexual dificulties (SD) in the decision to undergo surgery was rated lowest by residents ($p = 0.020$). Rating the risk for dislocation varied between occupations ($p = 0.008$) and gender ($p = 0.016$), female surgeons rated highest (median 5); 54.1% indicated the orthopaedic surgeon is responsible for providing information about the safe resumption of sexual activity.
Conclusions Surgeons show little attention to SF related issues in THA patients, which seems not in accordance to patients' needs. Addressing SF increases throughout a surgeon's career. There were divergent views and there is no "common advice" about the safe resumption of sexual activity. The results emphasize the need for guidelines and training in order to encourage addressing SF both, before and after THA.

The work was performed at the Department of Urology and Orthopaedics, University Medical Center Leiden, The Netherlands.

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Introduction

Each year more than one million patients worldwide undergo total hip arthroplasty (THA) for symptomatic hip arthritis (HA) [1]. Lavernia et al. (2015) found that HA interfered with sexual function (SF) in 82% of THA patients (mean age 65; range 20–89). Authors suggest SF should be routinely addressed with all patients undergoing THA [2]. Within fifty years of research, only a few studies have examined the impact of HA on SF and improvement of SF after THA [3–9]. Since 1991, Stern et al. (1991) found that nearly 80% of patients (who were satisfied with the THA result) felt the need for more information about SF afterwards; and in 20% sexual dysfunction (SD) had been an argument to undergo THA [4].

To our knowledge, there are only two studies published addressing SF in THA patients [7, 10]. However, these studies are small with less attention for specific views on patients' perspectives and safety matters.

In this context, the objectives of this study were to: (i) to explore practises of orthopaedic surgeons in addressing issues of sexual function (SF) in patients before and after total hip athroplasty (THA), (ii) surgeons' views on patients' perspectives of SF related issues, and (iii) surgeons' opinions on safe return to sexual activity after THA. Differences between the surgeons' gender and occupations (residents, practising surgeons, and retired surgeons) are of interest, in order to provide useful information to encourage communication about SF in future daily orthopaedic practice.

Methods

We conducted a cross-sectional survey among a group of orthopaedic surgeons with detailed measurements of SF related issues. We collected surgeons' opinions on patient perspectives, communication, and questions about safety matters, especially related to the safe resumption of sexual activity after THA and the surgical technique.

Development of questionnaire

A 28-item Dutch questionnaire was developed by an urologist (HE) for questioning medical disciplines; and previously used in cardiology, radiotherapy, oncology, nephrology [11–15].

This questionnaire was modified for use in orthopaedic practice by three authors (RH, PN, TH), and piloted on eight orthopaedic surgeons, five retired surgeons and 12 residents. Two questions were removed. It covers demographic questions (questions 1–7) and questions on the three objectives: (i) surgeons' views on patients' perspectives of SF related issues (questions 8–11); (ii) surgeons' practises in addressing SF issues and perceived barriers to communication (question 12–16); and (iii) surgeons' opinions on safe return to sexual activity after THA (question 17–22). Finally, there were some additional questions (questions 23–26). An in English translated version can be found in Appendix 1.

Surgeons and procedure

The 26-item modified questionnaire was posted to practising orthopaedic surgeons performing hip surgery ($n = 455$), retired orthopaedic surgeons ($n = 149$), and orthopaedic residents ($n = 245$) in the Netherlands. Addresses were retrieved from the member list of the Netherlands Orthopaedic Association (Nederlandse Orthopedische Vereniging, NOV). After screening on "performing hip surgery" and "living in the Netherlands" 849 addresses were retrieved. Two reminders were sent after six and 12 weeks. Data were collected and analysed anonymously. For research not involving patients, approval from an ethical board is not required in the Netherlands. Figure 1 shows the procedure for the selection of eligible respondents and response rates.

Statistical analysis

Statistical analyses were performed using IBM SPSS, version 22 for Mac/Windows. Most responses were scored on a visual analogue scale (VAS) ranging from no effect (1) to the strongest possible effect (10). For some questions an 'I do not know' option was available which was coded as '0' in the analyses.

The results are presented using descriptive analyses. Continuous variables were found to be not normally distributed and are therefore summarized as median (interquartile range IQR). Distributional differences between the occupations and genders were tested using Pearson's chi-squared tests or Mann-Whitney tests and Kruskal-Wallis test. Missing data were excluded from the percentage calculations; p-values of <0.05 were considered to be statistically significant.

Results

Of the 849 questionnaires sent out, 600 (70.7%) were returned. Of these, 74 respondents chose not to participate in the study. Reasons for non-participation were: no longer actively performing surgery ($n = 43$; 58.1%), lack of experience ($n = 21$; 28.4%), not relevant ($n = 6$; 8.1%), not interested ($n = 3$; 4.1%), and no time ($n = 1$; 1.4%). In total 526 respondents were included in the analysis (62.0%) Table 1.

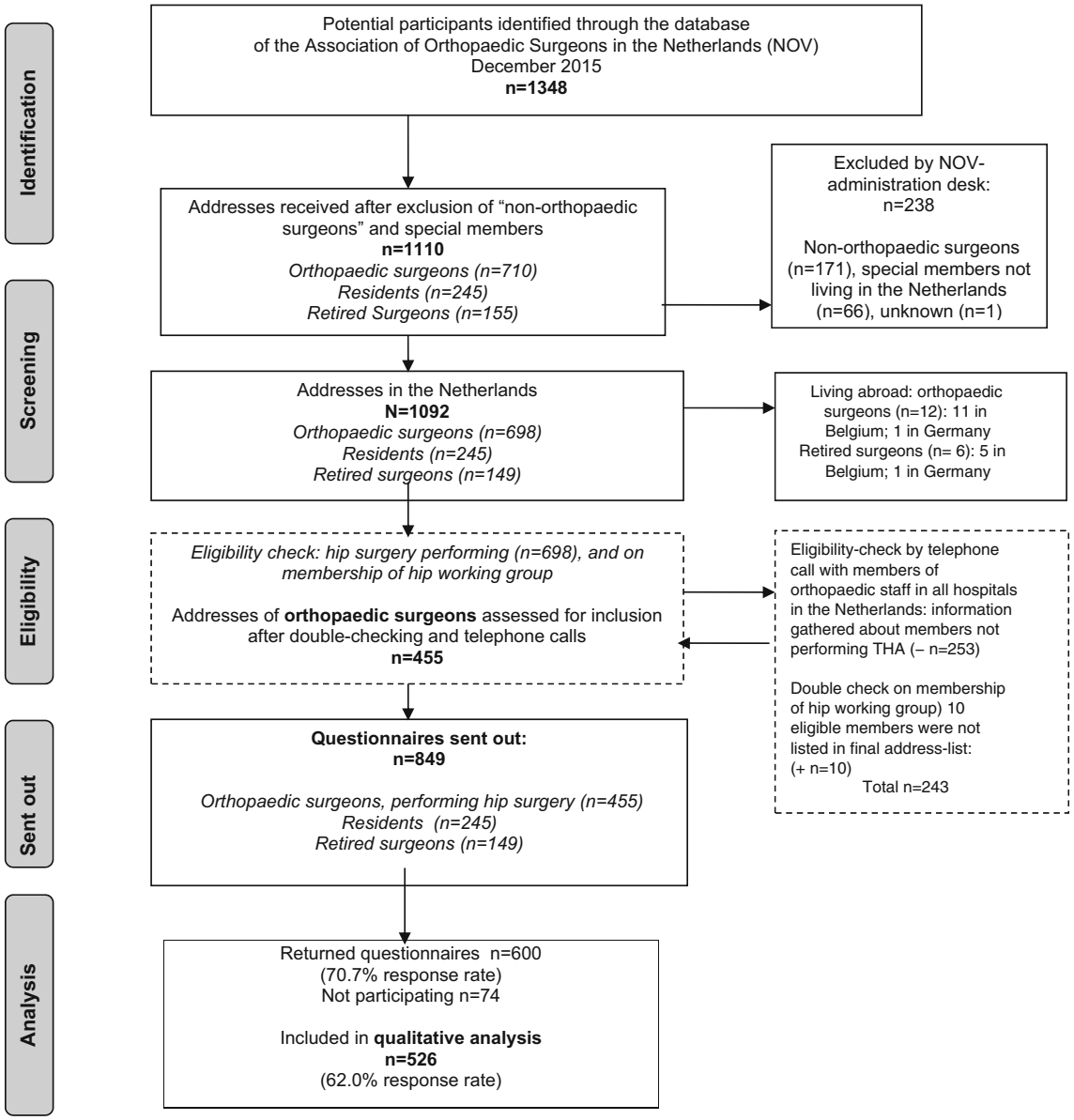

Fig. 1 Flowchart of the study procedure

Views on patients' perspectives of SF related issues

Table 2A shows the respondents' views regarding four questions: (i) the impact of HA on SF, (ii) improvement of SF after THA, (iii) the importance of SD in the decision to undergo surgery, and (iv) the need for information on the safe resumption of sexual activity. To each of those four questions, approximately 10% responded with "*do not know*" (range 7.0–13.5%). The beneficial effect of THA on SF was rated the highest in retired surgeons ($p \leq 0.001$), in which male surgeons scored higher than female surgeons ($p = 0.002$). The importance of SD in the decision to undergo surgery was rated lowest by residents ($p = 0.020$).

Opinions on a safe return to sexual activity after THR

Table 2B shows surgeons' opinions about six factors considered to be of influence in patients' safe resumption of intercourse. Approximately 3% of the respondents did not answer to all questions (missing range: 5–34). Compared to all categories of orthopaedic surgeons, residents thought more often that "age" influences safe resumption ($p = 0.001$). For per-operative stability the distribution differed between the occupations ($p = 0.001$), although the medians were equal.

Rating the risk for dislocation within the first three months, 69 chose the option "I do not know" (13.1%). The total cohort rated the risk at median 3 (IQR 2–6). The rating varied widely

Table 1 Characteristics of the respondents

Cohort-information	"Overall" n = 526 (100%) n (% of total)	Practising surgeons n = 326 (52%) n (% of total)	Residents n = 123 (23.4%) n (% of total)	Retired surgeons n = 77 (14.6%) n (% of total)
Gender				
Male surgeons	467 (88.8)	300 (92.0)	90 (73.2)	77 (100)
Female surgeons	59 (11.2)	26 (8.0)	33 (26.8)	
Age-groups				
20–30 year	32 (6.1)	1 (0.3)	31 (25.2)	–
31–40 year	192 (36.5)	100 (30.7)	92 (74.8)	–
41–50 year	97 (18.4)	97 (29.8)	–	–
51–60 year	89 (16.9)	88 (27.0)	–	1 (1.3)
61–70 year	79 (15.0)	36 (11.0)	–	43 (55.8)
> 70 year	37 (7.0)	4 (1.2)	–	33 (42.9)
Type of hospital/clinic				
University	60 (11.4)	16 (4.9)	36 (29.3)	8 (10.4)
General teaching	224 (42.6)	121 (37.1)	70 (56.9)	33 (42.9)
Regional/district	193 (36.7)	154 (47.2)	5 (4.1)	34 (44.2)
Specialized/ private	43 (8.2)	33 (10.1)	8 (6.5)	2 (2.6)
≥ 2 clinics	6 (1.1)	2 (0.6)	4 (3.3)	–
Experience				
0–11 months	25 (4.8)	4 (1.2)	21 (17.1)	–
1–2 year	61 (11.6)	10 (3.1)	51 (41.5)	–
3–5 year	108 (20.5)	59 (18.1)	49 (39.8)	–
6–10 year	70 (13.3)	70 (21.5)		
11–15 year	58 (11.0)	58 (17.8)	–	–
15–25 year	78 (14.8)	66 (20.2)	2 (1.6)	10 (12.8)
> 25 year	125 (23.8)	58 (17.8)	–	66 (87.0)
"Retired"	1 (0.2)			1 (0.2)
Number of THR performed per year				
< 50	198 (37.6)	70 (21.5)	114 (92.7)	14 (18.2)
50–100	214 (40.7)	172 (52.8)	9 (7.3)	33 (42.9
100–200	96 (18.3)	71 (21.8)	–	25 (32.5)
> 200	18 (3.4)	13 (4.0)	–	5 (6.5)
Surgical technique				
Posterior/postero-lateral	313 (59.5)	204 (62.6)	69 (56.1)	40 (51.9)
Anterior/anterolateral	63 (12.0)	42 (12.9)	11 (8.9)	10 (13.0)
Direct lateral	104 (19.8)	62 (19.0)	22 (17.9)	20 (26.0)
Various (≥2)	46 (8.7)	18 (5.2)	21 (17.1)	7 (9.1)

THA total hip arthroplasty

between occupations: median for practising surgeons: 3 (IQR 2–5); for residents: 4 (IQR 3–6); and for retired surgeons: 4 (IQR 2–6.50) (p = 0.008), and also across gender: males: 3 (IQR 2–5); females: 5 (IQR 3–6.50) (p = 0.016).

Overall, 7.4% (n = 39) reported knowledge of patients who had experienced dislocation caused by sexual activity; a further 5.5% (n = 29) suspected this. One third (33.1%; n = 174) indicated that resuming was advisable whenever the patient felt ready. This was most often advised by surgeons who practised an anterior approach (48.4%) compared to those who performed a posterior (32.3%) or direct-lateral approach (29.8%) (p = 0.024). Recommendation to wait six to eight weeks after surgery was responded by 42.5% (n = 223/525) (p = 0.008). In case of per-operative instability of the implant, 19% would address precautions on safely resuming; 39.7% of respondents would do so only when patients would ask for.

Table 2 Surgeons' views and opinions

Total Cohort (n526)	(n % of total)	n (% within group) Practising surgeons (*n* = 326)	Residents (*n* = 123)	Retired surgeons (*n* = 77)	*p value* across occupation #	n (% within group) Male surgeons (*n* = 467)	Female surgeons (*n* = 59)	*p value* between gender ##
A. On patients' perspectives of SF related issues								
Rating the impact of HA on SF*	482 (91.6)	307 (94.2)	115 (93.5)	60 (77.9)		425 (91.0)	57 (96.6)	
median (IQR)	7 (5–7)	7 (5–7)	7 (6–7)	6.5 (5–8)	0.924	7 (5–7)	7 (6–7)	0.644
Rating improvement of SF after THA*	480 (91.3)	303 (92.9)	115 (93.5)	62 (80.5)		426 (88.8)	54 (91.5)	
median (IQR)	7 (6–8)	7 (6–8)	6 (5–7)	8 (6–8)	≤0.001	7 (6–8)	6 (5–7)	0.002
Rating the influence of SD in patients' decision to undergo THA*	455 (86.5)	285 (87.4)	114 (92.7)	56 (72.7)		402 (88.4)	53 (89.8)	
median (IQR)	4 (3–6)	4 (3–6)	3 (3–5)	4.5 (3–7)	0.020	4 (3–6)	4 (3–5)	0.433
Rating patients' need for information on safely resuming*	489 (93.0)	303 (92.9)	118 (95.9)	68 (88.3)		433 (88.5)	56 (94.9)	
median (IQR)	7 (5–8)	7 (5–8)	7 (5–8)	7 (5–8)	0.335	7 (5–8)	7 (5–8)	0.455
B. On matters of safe return to sexual activity **								
Factor "Age"	500 (95.1)	309 (94.8)	118 (95.9)	73 (94.8)		444	56	
median (IQR)	4 (1–7)	3 (1–7)	6 (2–7)	4 (1–7)	0.001	3.5 (1–7)	5 (1.25–7)	0.906
Factor "being Male"	492 (93.5)	305 (93.6)	115 (93.4)	72 (93.5)		435	57	
median (IQR)	3 (1–6)	3 (1–5)	4 (2–6)	4 (1–7)	0.156	3 (1–6)	5 (2–6)	0.145
Factor "being Female"	496 (94.3)	307 (94.2)	117 (95.1)	72 (93.5)		437	59	
median (IQR)	4 (1–7)	4 |(1–7)	5 (2–7)	4 (1–6)	0.309	4 (1–7)	5 (3–7)	0.182
Factor "surgical technique"	506 (96.2)	315 (96.6)	119 (96.7)	72 (93.5)		449	57	
median (IQR)	7 (4–8)	6 (3–8)	7 (5–8)	7 (5–8)	0.252	7 (3–8)	7 (5–8)	0.556
Factor "stability peroperative"	508 (96.6)	315 (96.6)	120 (97.6)	73 (94.8)		450	58	
median (IQR)	8 (6–9)	8 (5–8)	8 (6–8)	8 (7–9)	0.001	8 (6–9)	8 (6–8)	0.309
Factor "Patients' knowledge which movements to avoid"	521 (99.0)	323 (99.1)	123 (100)	75 (97.4)		462	59	
median (IQR)	8 (7–9)	8 (7–9)	8 (8–9)	8 (6–9)	0.008	8 (7–9)	8 (8–9)	0.025

A:* Between 7 and 13.5% of surgeons chose option "do not know (resp.8.4%; 8.7%; 1.5%; 7.0%). B: **Not all respondents filled in all six factors. These (3%) missing data were excluded from the percentage calculating. Abbreviations: HA hip arthritis, SD sexual difficulties; SF sexual function; THA (total hip arthroplasty); IQR (inter quartile range). # Kruskal-Wallis test; ## Mann Whitney U test

Table 3 Surgeons' addressing SF in THA patients and perceptions of barriers to communication

		n (% within occupation)			*p value*	n (% within gender)		*p value*
Cohort size (n525) *	n (%) of total	Practising surgeons	Residents	Retired surgeons	across occupation #	Male surgeons	Female surgeons	between gender #
A. Surgeons' addressing SF								
(almost) Never	407 (77.5)	245 (75.2)	117 (95.1)	45 (59.2)	≤ 0.001	353 (75.8)	54 (91.5)	0.093
In <25–50% of patients	96 (18.3)	68 (20.9)	5 (4.1)	23 (30.3)		91 (19.5)	5 (8.5)	
In 50% of patients	8 (1.5)	4 (1.2)	1 (0.8)	3 (3.9)		8 (1.7)	-	
In >50–75%	7 (1.3)	5 (1.5)	-	2 (2.6)		7 (1.5)	-	
(almost) Always	7 (1.3)	4 (1.2)	-	3 (3.9)		7 (1.5)	-	
B. Barriers to communication: *n* = 407 (given as first reason) **								
Patients don't ask	193 (47.4)	117 (47.8)	46 (39.3)	30 (66.7)	0.130	168 (47.6)	25 (46.3)	0.790
I am not aware of possible needs	157 (38.6)	95 (38.8)	52 (44.4)	10 (22.2)		132 (37.4)	25 (46.3)	
It's a (too) delicate issue for me	12 (2.9)	4 (1.6)	7 (6.0)	1 (2.2)		10 (2.8)	2 (3.7)	
It's not relevant for orthopaedic patients	8 (2.0)	5 (2.0)	1 (0.9)	2 (4.4)		8 (2.0)		
I am not trained for that	8 (2.0)	4 (1.6)	4 (3.4)	-		8 (2.3)		
I don't think it's necessary	10 (2.5)	6 (2.4)	4 (3.4)			9 (2.5)	1 (1.9)	
There's no time for that	7 (1.7)	4 (1.6)	2 (1.7)	1 (2.2)		6 (1.7)	1 (1.9)	
I am concerned patients will misunderstand that	5 (1.2)	4 (1.6)	-	1 (2.2)		5 (1.4)		
Not part of my job	1 (0.2)	1 (0.4)	-	-		1 (0.3)		
For reasons related to culture, language, religion or ethnicity.	'-							
Other reasons	6 (1.5)	5 (2.0)	1 (0.9)	-		6 (1.7)		

* Overall one missing value; ** *n* = 407: Results of respondents who had reported "they never or rarely addressed SF" (Question 12) Abbreviations: SF (sexual function); SD (sexual difficulty); HA (hip arthritis); THA (total hip arthroplasty). # Pearson Chi-square test

Perceptions of barriers to communication

Table 3 summarizes the responses towards communication. Retired surgeons had addressed SF more often (41.8%) compared to residents (4.9%) and practising surgeons (24.8%) ($p \leq 0.001$). We asked respondents who rarely address SF, to rank three out of eleven possible barriers. The most mentioned barrier was that "patients do not ask" (47.4%) followed by "I am not aware of possible needs" (38.6%).

Almost 90% ($n = 467$) of the respondents reported that in discussing SF, patients' gender is not relevant. Of the 56 respondents who thought that gender could be an issue, discussing SF with female patients was perceived as more difficult in 8.6% (45/523) than with male patients (2.1%). Distribution on gender showed that in addressing SF, 9.5% (44/464) of male surgeons perceived female patients as more difficult, whereas 8.5% (5/59) of female surgeons perceived male patients as more difficult.

Addressing SF with senior patients >60 years of age was considered to be difficult in 25.9% (135/522): residents scored highest (44.3%; 54/122) compared to practising surgeons (23.8%; 77/324) and retired surgeons (5.3%; 4/76) ($p \leq 0.001$). Female surgeons (37.3%) were less inclined to discuss SF with patients >60 years compared to male surgeons (24.4%) ($p = 0.103$).

A total of 284 (54.1%) respondents indicated that the orthopaedic surgeon was primarily responsible for addressing SF with patients before and after THA. Residents more often suggested nurse practitioners were responsible (19.5%) than did orthopaedic (15.0%) and retired surgeons (11.8%) ($p = 0.002$). The need for additional training in addressing SF was reported by 52.1% of respondents ($p \leq 0.001$). Twenty-six percent did not consider SD as a relevant issue for hip patients in their practice, and 32.1% did not know ($p = 0.026$). Over half of respondents (55.1%) agreed that PROM questionnaires should include SF ($p = 0.013$).

Discussion

Surgeons show little attention to SF related issues in their THA patients. However, attention increases throughout career. We found divergent views and no "common advice" about safe resumption of sexual activity. Advices seem independent to surgical approach. Respondents rated the risk for dislocation during SA rather low.

Limitations and strengths of the study

The questionnaire was not psychometrically tested before use; this may have led to some shortcomings in validity and reliability, variables could have been misunderstood due to lack of formulating definitions. We suggest there were missing values for this reason in question 17 (3%). Not all respondents filled in second and third reasons (question 13). We, therefore, chose to analyse the first reason, only. Secondly, the cohort studied, is probably not generalizable. Sex-related issues are sometimes a 'taboo' topic for some cultures, considering that this activity may be seen as forbidden or sacred based on religious beliefs or morals. Therefore, the results should be considered as best-case estimates, not applicable to other populations.

Nevertheless, overall, this study contains very few missing values. Despite the inevitable risk of response and information bias, this study offers a high response rate, especially for this type of (sensitive) investigation. Furthermore, it benefits from a broad overview among attitudes and views of orthopaedic surgeons to SF related issues in THA patients, per occupation as well as per gender.

Addressing SF was difficult for 77.5% of the respondents and this finding is in line with the two available, previous studies: in the UK 69.0% [7] and in the USA 80.0% [10]. However, we found that retired surgeons had addressed SF more often (40.8%) than residents (4.9%), practising surgeons (24.8%), and female surgeons were less inclined to address SF (91.5%) as compared to their male colleagues (75.8%). That was a somewhat unexpected finding in view of previous research: Birkhoff et al. (2016) found that female physicians address a taboo topic (as sexual abuse) more frequently than do their male colleagues [16], and Bertakis (2009) reports about a more devoted attitude in female physicians (internal and general) spending more time to psychosocial counselling compared to their male colleagues, who were more technically oriented [17]. Although communication about SF in orthopaedic literature is limited [18], the importance of effective communication skills in the patient-doctor relationship is widely recognized [19].

We looked for barriers in communication. Although the most cited reason was because patients are not initiating SF issues themselves; the patients' age (>60 years) was of influence too (25.9%). Interestingly, the factor *no time* was not indicated to be important (1.7%) compared to approximately 40% of respondents in other area's of medical disciplines [11, 13, 14, 16]. It has been noted that patients do not raise the subject spontaneously [20]. We suggest surgeons should find effective standardized ways to provide "easy" communication about SF in their practises.

In an earlier systematic review, we published about improvements of sexual activity after THA (Δ 0–77%); and the patients' need for more advice (range 57–89%) [18]. For 20% of the patients, SF appears to be an argument to undergo THA [4, 6]. It is important to know patients' needs, motives and expectations about SF, and before starting the surgical

procedure. Especially, since literature suggests that unfulfilled expectations will lead to dissatisfaction [21]. Even more, several studies indicate that some patients (2–17%) never resume sexual activity again after THA [6, 9, 22, 23]. It seems to be highly important to have better insights into the determinants of SF in THA patients.

The patients' fear for dislocation has been emphasized (up to 80%) in previous literature [8]. In addition, the female patients in this study changed their preferred sexual positions after THA in non-recommended positions, mostly due to difficulties with the leg position [8]. Unknown is if this would lead to more dislocations of the prosthesis more easily. We had expected to find an association between the preferred technique and the surgeons' advice concerning the waiting time before resuming intercourse, however, we did not. One third of the respondents indicated that resuming was permitted whenever the patient felt ready, and this was unrelated to the surgical technique. This seems in line with a recent review stating that "a more liberal lifestyle restrictions and precautions protocol will not lead to worse dislocation rates, but instead will lead to earlier and better resumption of activities and higher patient satisfaction" [24].

To the best of our knowledge there are no studies focused on dislocation caused by intercourse and positions. Compared to 20% (n = 254) of the USA surgeons [10], in our study a surprisingly low proportion of respondents reported being aware of at least one patient experiencing THA dislocation during sexual activity (7.4%). Only one study has determined –theoretically, based on MRI, 3D studies, and animations- which sexual positions pose the greatest risk for impingement and thus for dislocation of the prosthesis [25]. Notwithstanding this, we asked surgeons if they would inform the patient about the risk for dislocation during sexual activity in case they noted during surgery that the stability of the prosthesis was suboptimal. Previous literature suggests that, in the event of instability patients should be informed about which sexual positions to avoid [1]. However, more than two thirds of respondents stated they would not inform the patients, or only if patients were to ask about it. Obviously, the majority of respondents reported that they routinely provide their patients with general information on how to prevent dislocation; probably supposing their patients can translate this into knowledge about safe sexual positions themselves. Therefore, it remains uncertain if indirect information puts patients into risk. Although, in the twentieth century, communication about SF still is difficult (from the perspective of both surgeon and patient), surgeons should look for standardized ways to provide patient-information and tailor-made advice both, before and after surgery. In line with this, we believe that evaluating SF by means of PROMs could help to encourage surgeons to address SF, and will shed light on this under-recognized issue in orthopaedic practice.

Conclusions

Despite research, which suggests patients want more information and discussion with their surgeons about SF and hip replacement surgery, the majority of Dutch orthopaedic surgeons surveyed appear to not address this need. Our research did however show that addressing SF increases throughout a surgeon's career. It was also clear that the age of both, the surgeon and patient influences this discussion. Surgeons' views were divergent and there was no "common advice" about safe resumption of sexual activity. The results emphasize the need for further research and guidance for surgeons and their team in order to encourage addressing SF both, before and after THA.

HA, hip (osteo)arthritis; IQRs, interquartile ranges; PROMs, patient-reported outcome measures; SD, sexual dysfunction; SF, sexual function; SQoL, sexual quality of life; THA, total hip arthroplasty; VAS, visual analogue scale.

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Authors' contributions Authors' contributions are as follows:

- RH, BvR, TH, PN en HE contributed to the conception/design of the study;
- RH collected the data and wrote the manuscript.
- Data analysis and interpretation of data was done by RH, HP, MN, PN.
- Statistically evaluation was done by RH, HP.
- Proofreading was performed by all authors MN, PN, BdO, TH, BvR, HE and HP;
- All authors critically revised the manuscript for important intellectual content.

The work was performed at the Department of Urology, University Medical Center Leiden.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent In the Netherlands for research not involving patients or interventions, approval by an ethical board is not required. The questionnaire did not compromise orthopaedic surgeons' integrity, nor could respondents be identified. For that reason an informed consent, from all individual participants included in the study was not requested. Participants received a letter explaining the purposes of the study and the guarantee of anonymity, and decided wheter to participate or not.

Appendix 1

If you do not wish to fill in this questionnaire, please indicate why:

- o I don't perform hip surgery
- o Not relevant
- o No time
- o Not interested
- o Lack of experience
- o Overly sensitive issue
- o Other reason, namely…

PERSONAL INFORMATION

1. What is your gender?
   - 0 Male
   - 0 Female

2. What is your age?
   - 0 20-30
   - 0 31-40
   - 0 41-50
   - 0 51-60
   - 0 61-70

3. What is your occupation?
   - 0 Orthopaedic surgeon
   - 0 Resident
   - 0 Orthopaedic surgeon/educator
   - 0 Retired orthopaedic surgeon

4. How many hip operations do you perform each year?
   - 0 Fewer than 50
   - 0 Between 50 and 100
   - 0 Between 100 and 200
   - 0 More than 200

5. What is your surgical approach?
   - 0 Posterior
   - 0 Anterior
   - 0 Direct-lateral
   - 0 Other, namely. ……

6. Where do you (mainly) perform surgery?
   - 0 Academic hospital
   - 0 General teaching hospital
   - 0 Regional or district hospital
   - 0 Specialized or private clinic

7. How long have you been performing total hip replacement (THA) surgery?
   - 0 0-11 months
   - 0 1-2 years
   - 0 3-5 years
   - 0 6-10 years
   - 0 11-15 years
   - 0 15–25 years
   - 0 > 25 years

PATIENTS PERSPECTIVES

8. How would you rate the impact of hip arthritis (HA) on patients' sexual function (SF)?
(1 = not important; 10 = extremely important)

1 2 3 4 5 6 7 8 9 10
0 I don't know

9. How would you rate the beneficial effect of total hip arthroplasty (THA) on SF?
(1 = none, 10 = extremely high)

1 2 3 4 5 6 7 8 9 10
0 I don't know

10. How would you rate the importance of patients' desire to improve their sexual function (SF) in their decision to undergo surgery?
(1 = not important, 10 = extremely important)

1 2 3 4 5 6 7 8 9 10
0 I don't know

11. How would you rate the need for information on the safe resumption of sexual activity?
(1 = no need, 10 = extremely high need)

1 2 3 4 5 6 7 8 9 10
0 I don't know

COMMUNICATION

12. Do you discuss questions concerning SF in patients with HA and after THA?
0 Rarely/never
0 With fewer than 25-50% of patients
0 With around 50% of patients
0 With more than 50-75% of patients
0 (Almost) always

13. If you "rarely or never" discuss questions concerning SF with patients, what is the reason for this? Please rate the most important three factors, with 1 as the most important.
0 I am not aware of possible needs
0 Patients don't ask
0 It's not part of my job
0 There's no time for it
0 It's a too delicate issue for me
0 I don't think it's necessary
0 I'm not trained for that
0 I'm concerned patients will misunderstand that
0 It's not relevant for orthopaedic patients
0 For reasons related to culture, language, religion or ethnicity
0 Other reason, namely…….

14. In discussing SF issues, does the patient's gender make a difference?
0 No, gender makes no difference
0 Yes, I find it more difficult to discuss this with women
0 Yes, I find it more difficult to discuss this with men

15. In discussing SF issues, does the patient's age make a difference?
0 No, age makes no difference
0 Yes, I find it more difficult to discuss this with senior people (60+)
0 Yes, I find it more difficult to discuss this with younger people (under 60)

16. In your opinion, who is responsible for answering patients' questions about resumption of SF after THA?
    0 Orthopaedic surgeon
    0 General practitioner
    0 Nurse practitioner/physician assistant
    0 Physiotherapist
    0 Nobody
    0 Other, namely …….

SAFETY MATTERS

17. Please indicate, on a scale from 1-10, which of the factors below matter in relation to the safe resumption of sexual activity after THA? (1 = not important, 10 = extremely important)

    0 Age 1 2 3 4 5 6 7 8 9 10

    0 Male patient 1 2 3 4 5 6 7 8 9 10

    0 Female patient 1 2 3 4 5 6 7 8 9 10

    0 Surgical approach 1 2 3 4 5 6 7 8 9 10

    0 Peroperative stability 1 2 3 4 5 6 7 8 9 10

    0 Knowledge of movements to avoid 1 2 3 4 5 6 7 8 9 10

18. How would you rate the risk of dislocation when resuming sexual activity within the first three months after the operation? (1 = no risk, 10 = extremely high risk)

    1 2 3 4 5 6 7 8 9 10
    0 I don't know

19. Do you think information will matters in reducing risks?
    0 Yes
    0 No

20. If the hip is stable and the patient were to ask your advice on when sexuality can be safely resumed, what would your response be?
    0 As soon as the patient is ready
    0 After 2-4 weeks
    0 After 6-8 weeks
    0 After 3 months
    0 After 6 months

21. If patients were to ask your advice on safe positions when resuming sexuality, what would your response be? (Please choose **one** answer that fits best.)
    0 I'd refer them to the Internet
    0 I'd refer them to a general practitioner
    0 I'd refer them to a nurse practitioner/physician assistant
    0 I'd refer them to a physiotherapist
    0 I'd give them a flyer
    0 I'd explain how to prevent dislocation
    0 I'd tell them there are no restrictions whatsoever

22. If you sense during the operation that stability is suboptimal, would you inform your patient about the risk of dislocation during sexual activity?
    0 Yes
    0 No
    0 Only if patients ask
    0 Other, namely……

GENERAL

23. Have you ever come across a patient with a dislocation of the hip caused by sexual activity?
    0 Yes
    0 Probably, but I didn't ask
    0 No

24. Do you think questionnaires used for Patient Reported Outcome Measures (PROMs) should include items on SF?
    0 Yes
    0 No
    0 Don't know

25. Do you see sexual dysfunction (SD) as a relevant issue for hip patients in orthopaedic practice?
    0 Yes
    0 No
    0 Don't know

26. If research were to demonstrate that SD is an important issue for hip patients, would you feel the need for training dedicated to this subject?
    0 Yes
    0 No

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