

WOMEN'S SEXUAL HEALTH

Kamasutra in Practice: The Use of Sexual Positions in the Czech Population and Their Association With Female Coital Orgasm Potential



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ABSTRACT

Introduction: A limited number of scientific studies explore the frequency with which various sexual positions are used in human populations and the potential of particular sexual position to facilitate female coital orgasm.

Aim: The aim of this study was to provide data about the prevalence and frequency of various sexual positions, their rated pleurability, and their association with female coital orgasm consistency (COC).

Methods: A sample of Czech heterosexual population (11,225 men/9,813 women) were presented with a list of 13 sexual positions in black-and-white silhouettes. For each position, they indicated frequency and pleurability. COC was assessed as the proportion of penile-vaginal intercourse with a current partner which led to orgasm.

Main Outcome Measure: Participants reported the frequency of use of sexual positions and rated their pleurability. Using ordinal logistic regression, association between the COC and frequency of use of coital positions was tested.

Results: In both men and women, the most commonly used sexual positions were face to face/male above, face to face/female above, and kneeling/rear entry. Nonetheless, there emerged some gender differences in the rating of pleurability of various positions (all $P < .001$). We found that a higher proportion of female coital orgasms are positively associated with the frequency of use of face to face/female above (odds ratio [OR] = 1.005, $P < .001$) and sitting/face-to-face positions (OR = 1.003, $P < .001$) and negatively associated with the frequency of kneeling/rear entry position (OR = 0.996, $P < .001$).

Conclusions: Our findings suggest that there are no gender differences in the frequency of use of sexual positions, but their rated pleurability differs between men and women, and higher frequency of use of face-to-face positions with female above increases the likelihood of achieving coital orgasm during penile-vaginal intercourse. Most results, however, were of small effect sizes, and more research is needed to further explore this issue.

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Key words: Sexual Behavior; Sexual Positions; Female Orgasm; Gender Differences

INTRODUCTION

The popularity of various sexual positions among men and women has long been a favourite topic of articles in lifestyle magazines. Books on the art of lovemaking¹ describe hundreds of positions lovers can use during their sexual encounters, and their pleurability and potential of leading to a female orgasm is a frequent subject of discussion in general forums. The

amount of scientific research on the subject is, however, very limited. Awareness of prevalence of sexual positions would help monitor trends in sexual behavior, for instance, increase in the prevalence of anal sex.² It could also enable cross-national comparisons of how different cultures vary in the use of sexual activities (eg, some cultures view oral sex as unnatural³). Such information is crucial for the development of sufficient sexual education about contemporary preferred sexual

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behavior, and moreover, these findings could provide public health professionals with up-to-date information about partnered sexual behaviors and thus help develop adequate treatment strategies to increase the level of sexual wellbeing in individuals as well as couples.

Existing studies tend to focus on the prevalence and/or frequency of particular heterosexual sexual behaviors, especially on giving and receiving oral sex, vaginal intercourse, and anal sex.^{4–7} National sex surveys reveal a wide variation in heterosexual practices. A recent Czech survey found that 85% of women and 91.2% of men had in their lifetime engaged in vaginal intercourse, app. 55% of women and 67% of men have experience with receiving oral sex, and 20% of women and 27% of men engaged in insertive anal sex.⁸ In Australia, the proportion of men and women who had in their lifetime experienced vaginal intercourse is 92%,⁷ while in the United States, the proportion stands at 91% for women and 86% for men.⁴ For oral-genital sex, these figures stand at 67% for women and 78% for men in Australia and 77% of women and 81% of men in the United States. Lifetime experience with receptive anal sex was reported by 15% of women in Australia and 37% of women in the United States, whereas for insertive anal sex, these figures stood at 21% of men in Australia and 36% of men in the United States.

Kinsey et al^{9,10} in his classical reports on sexual behavior of the US population lists the following ranking of frequency of use of 7 coital positions in men and women: male above, female above, side, rear entrance, sitting, and standing. Swieczkowski and Walker¹¹ investigated preferences for and the frequency of use of various sexual positions in young married women in the United States. With respect to positions and practices relevant to our study, they arrived at the following ranking of frequency of use: face to face/male above, fellatio, face to face with female above, cunnilingus, face to face side position, prone rear entry, sitting face to face, kneeling rear entry, sitting rear entry, and anal sex. They also found that the frequency of use of sexual positions highly correlated with individual preference for a given position and the position's rated effectiveness in producing female orgasm.

Various research in human populations shows that sexual positions have varying effects on female orgasm potential. A representative survey of Swedish women¹² assessed the use of various sexual techniques and associations between the techniques and orgasmic function. A major predictor of Swedish women's orgasmic function was a wider repertoire of sexual techniques used, such as manual and oral stimulation, or the use of dildo during sexual activity. In noncoital activities, the prevalence of women who reached orgasm by manual genital caressing was 75–89% and by cunnilingus 61–73%, whereby proportions differed depending on the age category. During penile-vaginal intercourse, 51–57% women were able to reach orgasm solely by penile movements in the vagina, and almost 50% of women reported they could reach orgasm without clitoral stimulation. This Swedish study unfortunately did not specify the coital positions.

To date, links between orgasmic experience and specific coital and noncoital activities were reported only by Swieczkowski and Walker,¹¹ who asked women how often they experienced orgasm during various sexual activities. Answers were indicated on a 40-point Likert scale (with ends verbally anchored as “not at all” and “exclusively” and the range in-between divided in 8 segments, each with 5 further subdivisions). Mean ratings ordered the positions as follows: face to face male above (28), face to face female above (26.36), manipulation of female genitals by partner (23.47), cunnilingus (17.94), face to face side position (16.73), stimulation of breasts and other nongenital areas (11.69), sitting face to face (10.78), prone rear entry (8.23), kneeling rear entry (5.85), sitting rear entry (3.81), stimulation by vibrator (2.26), and anal intercourse (0.89).

Awareness of differences in the effectiveness of various sexual positions for achievement of female orgasm is also mirrored in sexual therapy. Eichel, De Simone Eichel, and Kule¹³ introduced the coital alignment technique, an effective sexual technique designed to boost female orgasmic ability. This coital position combines the standard missionary position with coordinated sexual movements. In particular, the male pubic bone and penis base rub against women's clitoris, so the position combines vaginal penetration with constant stimulation of the clitoris. The efficiency of coital alignment technique was confirmed by several subsequent studies (for a review, see the article by Pierce¹⁴).

AIMS

The aim of the present study is to provide evidence on the underresearched area of usage of various sexual positions in heterosexual men and women during sexual intercourse. Existing studies tend to focus on the prevalence/frequency of vaginal intercourse, oral sex, or anal sex irrespective of the position used. In this study, we want to address this gap in existing knowledge. We explore gender differences in the rated pleasurability of various sexual positions and investigate associations between coital positions used, age, frequency of sexual activities, and coital orgasm consistency (COC) in women. Based on previous studies, we predict that women with higher COC would be older, with higher monthly frequency of sexual activities, and would use face-to-face sexual positions during sexual intercourse over the past 5 years more often.

MATERIALS AND METHODS

Sample and Procedure

The methods and description of the electronic survey “Sexual Preferences and Behaviors Inventory 2015” are described in detail elsewhere.¹⁵ In brief, data were collected between January 2015 and March 2018 via an online questionnaire distributed by Qualtrics (www.qualtrics.com). Participants were recruited via advertisements placed at a Facebook page and in the media. Only participants older than 15 years were allowed to take the questionnaire. Participants were informed about the aims of the study

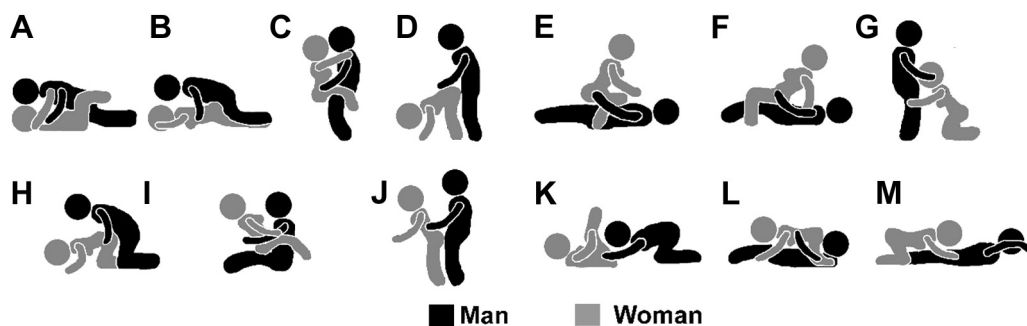


Figure 1. Sexual positions. A = Face to face/male above; B = Prone rear entry; C = Standing/face to face; D = Standing; E = Face to face/female above; F = Supine/female above; G = Fellatio/standing; H = Kneeling/rear entry; I = Sitting/face to face; J = Standing/rear entry; K = Cunnilingus; L = Sixty-nine; M = Fellatio/female above.

on the first page of the electronic survey. Those who agreed to participate, pressed the “Next” button ($n = 48,407$) and were asked about their sexual experiences, preferences, and behaviors.

Ethical Considerations

All participants received information about the purpose of the study and confidentiality of all information they would provide and gave us their informed consent for participation in the study online. No reward was disbursed for participation in the study. The study was approved by the Institutional Review Board of the Faculty of Science, Charles University, Czech Republic (No. 2015/01).

Measures

For the purpose of our study, we used questions pertaining to sociodemographic information and sexual behavior.

Sociodemographic Characteristics

Sociodemographic data included information about the year of birth, sex (male, female), education, and relationship status (single or having a partner).

Sexual orientation was assessed by the following question: “Do you consider your sexual orientation homosexual rather than heterosexual?” Responses were indicated using a 7-point Likert scale, with 1 corresponding to “Definitely not”, 7 to “Definitely yes”, and the in-between range indicated by a numerical scale. As our aim was to study sexual behavior in heterosexual individuals, participants scoring from 4 to 7 ($n = 2,156$) and respondents who did not respond to this question ($n = 25,213$) were excluded from further analyses. Monthly mean frequency of penile-vaginal intercourse over the past year was assessed on a scale ranging from 1 to 8 (1 = *Not even once*, 2 = *Once*, 3 = *Twice or three times*, 4 = *4–6 times*, 5 = *7–10 times*, 6 = *11–20 times*, 7 = *21–30 times*, 8 = *More than 30 times*).

Questions on the Use of Sexual Positions

The questionnaire included visual black-and-white silhouettes depicting 13 sexual positions (9 coital, 4 noncoital; Figure 1).

These sexual positions were chosen based on previous studies^{9–11} and a Czech book on the art of lovemaking widely used in therapeutic practice in the Czech Republic.¹⁶ Respondents assessed their experience with the use of these positions by answering the following questions: (i) “How often did you engage in the following sexual position over your lifetime?” (indicated on a 7-point verbally-anchored ordinal scale: 1 = *Never*, 2 = *Once or twice*, 3 = *At most 5 times*, 4 = *At most 15 times*, 5 = *At most 30 times*, 6 = *At most 100 times*, 7 = *More frequently*); (ii) “Was it pleasurable?” (indicated on ordinal 4-point scale ranging from 1 = *Not at all* to 4 = *Very pleasurable*); (iii) “Please estimate the percentage of sexual encounters in the past 5 years when you used a particular position” (indicated on a continuous scale from ranging from 0% to 100%).

Assessment of COC

To assess the percentage of coital activities resulting in orgasm, women answered the following question: “Please indicate the percentage of penile-vaginal intercourse which led to orgasm elicited solely by coital movements with the current partner?” Respondents indicated their answer using a 6-point scale (1 = *Never*, 2 = 5–25%, 3 = 25–50%, 4 = 50–75%, 5 = 75–95%, 6 = *Almost always*).

Statistical Analysis

Before running a statistical analysis, we filtered out 1% of our data exceeding 3 standard deviations in the following variables: age and duration of the test.

We used IBM SPSS Statistics 21 (SPSS Inc, Chicago, IL) for all statistical analyses. P values $< .05$ were considered statistically significant. First, we counted the descriptive data on the prevalence, pleasurable, and frequency of use of the 13 sexual positions we followed. For prevalence assessment, participants’ responses on the frequency of particular positions over lifetime and in the past 5 years were converted to a binary variable: 0 = not used at all (1/0%) and 1 = used (2–7/1–100%). To examine gender differences in the frequency of use, both over lifetime and in the past 5 years, and pleasurable of sexual positions, we performed a nonparametric Mann-Whitney test. Significant between-group differences were explored and

Table 1. Demographic characteristics of the sample

Variable	Men (N = 11,225)	Women (N = 9,813)
Age (in years)*	35.87 (11.9)	30.9 (10.6)
Education (%)		
Primary	2.9	5.7
Vocational	6.8	3.0
Secondary	43.4	46.9
Graduate degree	47	44.4
Relationship (%)		
Yes	74.4	73.1
Length of relationship (in years)*	7.9 (9.7)	5.4 (7.6)
Sexual orientation (%) [†]		
1 (Not at all)	88.9	82.3
2	9.6	14.1
3	1.5	3.6
Monthly mean frequency of sexual activities* [‡]	4	4.3

Missing values excluded.

*Mean value (SD).

[†]Participants answers to the question "Do you consider your sexual orientation homosexual rather than heterosexual?" Answers indicated on the following scale: 1 = Definitely Not to 7 = Definitely Yes.

[‡]Answers indicated on the following scale: 1 = Not even once, 2 = Once, 3 = Twice or Three times, 4 = 4–6 times, 5 = 7–10 times, 6 = 11–20 times, 7 = 21–30 times, 8 = More than 30 times.

qualified by calculating effect sizes using Cohen's d coefficient.¹⁷ To explore associations between the COC, frequency of use of 9 coital positions during intercourse over the past 5 years, age, and the mean frequency of sexual activities, we performed ordinal logistic regression analyses (enter method with COC as a dependent variable).

RESULTS

Our final sample included a total of 21,038 Czech men (n = 11,225) and women (n = 9,813) aged 18–86 years. The mean age was 35.87 (SD = 11.93) for men and 30.9 (SD = 10.57) for women. Demographic characteristics of the sample are presented in Table 1.

Heterosexual men and women both reported that the most frequently used sexual positions are face to face/male above (A), face to face/female above (E), and kneeling/rear entry (H). As shown in Table 2, however, we found significant gender differences between heterosexual men and women in the frequency of use of particular sexual positions over lifetime (This was the case for 9 out of 13 positions we investigated). Heterosexual men reported the use of a number of positions, especially prone rear entry (B), standing/face to face (C), standing (D), face to face/female above (E), sitting/face to face (I), cunnilingus (K) and sixty-nine (L), significantly more than

heterosexual women did. Among heterosexual women, positions fellatio/standing (G) and kneeling/rear entry (H) were reported to be used more frequently than by heterosexual men. Cohen's d, however, shows that the effect size of these results was either very small or negligible.

Median frequencies of sexual positions used over the past 5 years are shown in Figure 2. Not surprisingly, the same 3 positions reported as most frequently used over lifetime also showed up as the most frequently used over the past 5 years: face to face/male above (A; median 80% for both sexes), face to face/female above (E; median 40% for both sexes), and kneeling/rear entry (H; median 38% for men, 42% for women). Several other gender differences also appeared in the frequency of use of various positions over the past 5 years (Table 3), but their effect sizes were too small to be of interest.

We found significant gender differences in the pleurability of all 13 positions (all $P < .001$) (Table 4). The largest differences were found in positions where men receive oral sex (G, fellatio/standing; M, fellatio; L, sixty-nine), but the effect size indicated a small effect. The smallest difference was found in the face to face/male above position (A).

Table 5 provides an overview of the proportion of sexual encounters resulting in female orgasm during various positions involving penile-vaginal intercourse with a stable partner. Interestingly, almost one-third of women reported that they never experienced orgasm during coitus with their stable partner.

To examine which sexual positions best predicted the occurrence of orgasm during coitus (assessed as COC), we performed an ordinal regression analysis (enter method). Note that while there are 6 response ordinal categories, 5 cutoff points (thresholds) were created. A reference category was determined as the one with the highest ordered level. In this case, $Y = 6$ (ie, COC is almost always) was considered a reference category. In Table 6, the model shows that COC with a current partner was significantly predicted by older age (OR = 1.021, $P < .001$), higher monthly mean frequency of sexual activity (OR = 1.119, $P < .001$), higher frequency of use of face to face/female above (OR = 1.005, $P < .001$) or sitting/face-to-face position (OR = 1.003, $P < .001$), and a lower frequency of kneeling/rear entry position (OR = 0.996, $P < .001$).

DISCUSSION

The aim of our study was to provide data about the prevalence and frequency of use of various sexual positions, to assess rated pleurability of these positions, and to test their association with COC. Overall, the study presents descriptive data about a lifetime and 5-year frequency of the use of 9 coital and 4 noncoital positions. In both men and women, face to face/male above, face to face/female above, and kneeling/rear entry were reported as the most commonly used positions. Our study revealed a number of gender differences in the frequency of use of particular positions across the Czech

Table 2. Lifetime prevalence of the use of sexual positions and gender differences in the frequency of their use among heterosexual men and women

Position	Lifetime prevalence						Z [‡]	Cohen's d
	Men			Women				
	N	%*	Mdn (M) [†]	n	%*	Mdn (M) [†]		
A = Face to face/male above	10,784	97.0	7 (6.35)	9,502	97.8	7 (6.39)	-1.81	.00
B = Prone rear entry	10,617	91.6	6 (5.22)	9,395	93.4	6 (5.35)	-4.24**	.00
C = Standing/face to face	10,564	77.1	3 (3.09)	9,364	76.4	3 (2.98)	-4.12**	.00
D = Standing	10,562	80.7	4 (4.06)	9,347	75.6	3 (3.61)	-14.83**	.01
E = Face to face/female above	10,684	95.1	6 (5.65)	9,399	95.2	6 (5.55)	-5.01**	.00
F = Supine/female above	10,459	76.8	3 (3.56)	9,298	77.6	3 (3.51)	-1.50	.00
G = Fellatio/standing	10,600	89.1	5 (4.8)	9,362	90.2	6 (5.03)	-8.56**	.00
H = Kneeling/rear entry	10,590	93.7	6 (5.6)	9,381	95.0	6 (5.69)	-2.70*	.00
I = Sitting/face to face	10,499	87.7	5 (4.38)	9,315	89.4	5 (4.47)	-2.78*	.00
J = Standing/rear entry	10,445	84.9	4 (4.21)	9,242	85.1	4 (4.23)	-.43	.00
K = Cunnilingus	10,609	91.8	6 (5.47)	9,337	89.0	6 (5.08)	-15.59**	.01
L = Sixty-nine	10,551	87.1	5 (4.54)	9,324	86.8	5 (4.28)	-9.92**	.00
M = Fellatio/female above	10,593	92.1	6 (5.37)	9,326	89.8	6 (5.34)	-.15	.00

Missing values excluded.

* $P < .01$; ** $P < .001$.

*Binary value.

[†]Median for "How often did you experience this position?" (1 = Never, 2 = 1 to 2 times, 3 = At most 5 times, 4 = At most 15 times, 5 = At most 30 times, 6 = At most 100 times, 7 = More frequently).

[‡]Z score for Mann-Whitney U test.

population, but owing to relatively small effect sizes and a nonrepresentative sample, the results must be interpreted—and especially generalised—with caution. We found a number of gender differences in the rating of pleasurability of particular positions, where men rated positions where the male receives oral sex (fellatio, sixty-nine) as more pleasurable than women did. Higher COC was positively associated with the frequency of use of face to face/female above and sitting/face-to-face position and negatively predicted by the kneeling/rear entry position.

In both men and women, face to face/male above and face to face/female above were the 2 most common sexual positions experienced both over lifetime and in the past 5 years, a finding which is in line with earlier research.^{9,10} These positions allow face-to-face contact and facilitate continued facial as well as oral communication between partners during sex. Recognition of partner's sexual pleasure during a particular sexual position can increase its use in dyadic sexual repertoire, and moreover, face-to-face positions make it possible for partners to kiss and hug each other, which can further intensify sexual pleasure.

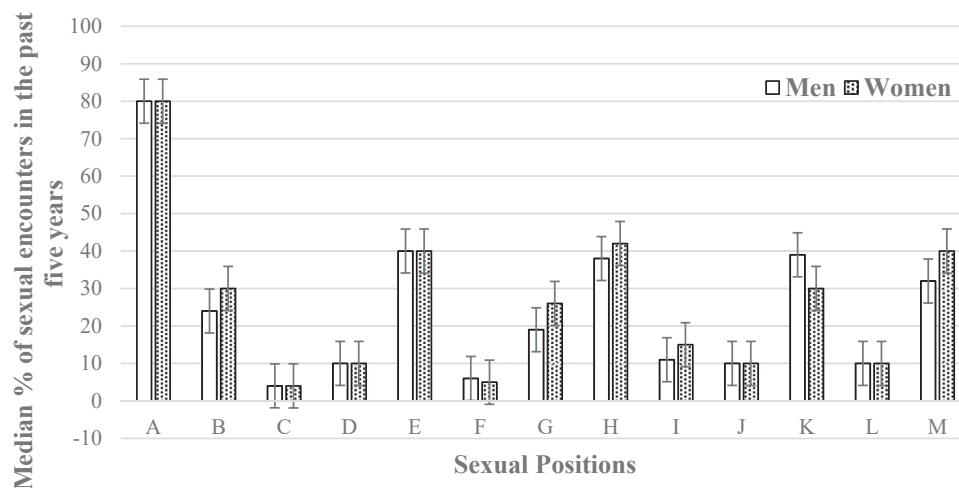


Figure 2. Median frequency of sexual positions used by heterosexual men and women in the past 5 years.

Table 3. Prevalence of the use of sexual positions in the past 5 years and gender differences in frequency in heterosexual men and women

Position	Past 5 years prevalence						Z [‡]	Cohen's d
	Men			Women				
	N	%*	Mdn (M) [†]	n	%*	Mdn (M) [†]		
A = Face to face/male above	10,581	96.8	80 (69.45)	9,280	97.5	80 (70.82)	-2.58*	.00
B = Prone rear entry	9,946	91.8	24 (33.23)	8,846	93.0	30 (38.62)	-11.19**	.00
C = Standing/face to face	8,646	75.3	4 (9.56)	7,751	74.2	4 (10.11)	-0.34	.00
D = Standing	9,457	84.7	10 (23.06)	8,090	79.9	10 (20.98)	-8.40**	.00
E = Face to face/female above	10,167	94.7	40 (44.04)	8,882	94.7	40 (44.82)	-1.39	.00
F = Supine/female above	8,633	77.7	6 (14.9)	7,806	77.3	5 (15.66)	-0.22	.00
G = Fellatio/standing	9,644	88.7	19 (30.48)	8,588	89.5	26 (36.14)	-11.29**	.00
H = Kneeling/rear entry	10,019	93.7	38 (42.31)	8,885	94.3	42 (46.33)	-8.34**	.00
I = Sitting/face to face	9,220	85.7	11 (22.27)	8,349	87.3	15 (24.68)	-5.48**	.00
J = Standing/rear entry	9,195	83.5	10 (19.72)	8,161	83.3	10 (21.19)	-2.04*	.00
K = Cunnilingus	9,884	92.2	39 (44.36)	8,484	89.8	30 (37.57)	-13.64**	.01
L = Sixty-nine	9,378	85.4	10 (22.25)	8,527	83.7	10 (20.49)	-5.63**	.00
M = Fellatio/female above	9,861	91.8	32 (40.26)	8,592	91.3	40 (44.73)	-8.56**	.00

Missing values excluded.

* $P < .01$. ** $P < .001$.

*Binary value.

[†]Median (mean) for the percentage of sexual encounters when the position was used in the past 5 years (from 0% to 100%).

[‡]Z score for Mann-Whitney U test.

Not surprisingly, we confirmed that in Czech, sample positions with oral-genital contact are also frequently used. In fact, the proportions we found are even higher than those reported in previous foreign^{4,7} and Czech studies.⁸ This could be at least in part due to the lower mean age of our sample in comparison to samples used in population surveys: A number of studies reported that the percentage of noncoital activities tends to be higher in people in their twenties, peaking in their thirties.^{4,7,18}

Although we found several gender differences in the reported prevalence and frequency of use of sexual positions, small effect sizes indicate that these differences are of marginal importance. From a theoretical point of view, there was no reason to expect strong gender differences. Our analysis was limited to a heterosexual population, and given that the 2 sexes engage in sexual activities together, frequencies of use of particular sexual positions in a representative population sample should be closely aligned.⁸

Table 4. Gender differences in rated pleasurability of sexual positions

Position	Men		Women		Z	Cohen's d
	n	Mean rank	n	Mean rank		
A = Face to face/male above	10,168	9718,9	9,073	9511,29	-3,66**	.00
B = Prone rear entry	9,069	9032,34	8,163	8154,5	-12,95**	.00
C = Standing/face to face	9,532	9292,21	8,231	8406,95	-13,85**	.01
D = Standing	8,227	8158,37	7,178	7181,08	-14,34**	.01
E = Face to face/female above	9,517	9617,22	8,595	8435,63	-19,48**	.02
F = Supine/female above	9,675	9803,28	8,681	8482,18	-22,53**	.02
G = Fellatio/standing	8,742	9035,02	7,766	7375,89	-24,92**	.03
H = Kneeling/rear entry	9,872	10325,5	8,71	8119,53	-34,1**	.06
I = Sitting/face to face	8,524	9,018	7,16	6443,06	-39,34**	.09
J = Standing/rear entry	8,096	8936,02	7,204	6205,81	-40,64**	.10
K = Cunnilingus	9,087	10152,3	8,022	6745,67	-50,1**	.14
L = Sixty-nine	9,596	10623,5	8,322	7040,74	-54,34**	.16
M = Fellatio/female above	9,307	10608,5	8,347	6841,71	-55,69**	.17

Missing values excluded.

** $P < .001$.

Table 5. Percentage of coitus with partner resulting in orgasm (in %)

COC	Women (n = 7,450)
Never	32.4
5–25%	21.6
25–50%	9.8
50–75%	10.5
75–95%	13.7
Almost always	12.0

COC = coital orgasm consistency.
Missing values excluded.

Nevertheless, an examination of differences in the pleasurability of sexual positions indicates that women tend to rate positions with deep vaginal stimulation as the most pleasurable, whereas men tend to rate fellatio as the most pleasurable. Oral-penis contact received lower pleasurability ratings in women, and positions involving it showed the highest gender difference in ratings. This can be explained by reluctance to manipulate and swallow semen¹⁹ as well as women's higher vigilance in terms of hygiene and negative sexual health outcomes.²⁰ Despite this discrepancy between the sexes, positions involving oral-penis contact were reported by both men and women as frequently used. This contrast between rated pleasurability and frequency could be influenced by insufficient communication between partners about their sexual preferences,²¹ by women's higher susceptibility to their partner's needs, or even by pornographic

materials where fellatio is one of the most commonly appearing practices, which may create the impression that it ought to be an integral part of each sexual intercourse.²² These speculations are, however, merely preliminary because the scale used for rating pleasurability in the current project was not sensitive enough (4-point scale). Particularly in the male sample, this resulted in a ceiling effect. In future studies, a more sensitive scale should be used.

One-third of women reported they had never experienced orgasm during coitus with their partner. This result may be due to nonrepresentative sampling because a representative sample of Czech women showed that only 21.9% never had a vaginal orgasm.²³ The higher numbers of respondents willing to share intimate and possibly uncomfortable information (such as absence of orgasm in women) could be at least in part accounted for by online sampling, which offers a higher perceived level of anonymity than for instance the use of computer-assisted personal interviewing or face-to-face interviewing methods.²⁴ Although two-thirds of women can experience orgasm during coitus, one-third do so less than half the time. In our study, we did not investigate possible associations between psychological and relationship-related factors on the one hand and the frequency of COC (for a review, see studies by Meston et al and Brody^{25–27}) on the other hand to further elucidate these findings.

Associations between the COC and frequency of use of particular coital positions during intercourse suggest that women

Table 6. Results for the ordinal logistic regression model predicting coital orgasm consistency (COC) in women

Variable	Women			
	β (SE)	OR	95% CI*	P
Age (years)	.021 (.002)	1,021	1.018/1.024	<.001**
Monthly mean frequency of sexual intercourse	.112 (.010)	1,119	1.096/1.141	<.001**
A = Face to face/male above [†]	.000 (.001)	1.000	.998/1.001	.507
B = Prone rear entry [†]	.000 (.001)	1.000	.999/1.002	.504
C = Standing/face to face [†]	.002 (.001)	1.002	1.000/1.005	.081
D = Standing [†]	.002 (.001)	1.002	1.000/1.003	.067
E = Face to face/female above [†]	.005 (.001)	1.005	1.004/1.006	<.001**
F = Supine/female above [†]	-.001 (.001)	.999	.997/1.001	.183
H = Kneeling/rear entry [†]	-.004 (.001)	.996	.994/.997	<.001**
I = Sitting/face to face [†]	.003 (.001)	1.003	1.002/1.005	<.001**
J = Standing/rear entry [†]	.001 (.001)	1.001	.999/1.003	.196
Thresholds				
1 (Never)	1.165 (.095)	3,206	2.662/3.861	
2 (5–25%)	1.782 (.097)	5,942	4.914/7.185	
3 (25–50%)	2.114 (.098)	8,281	6.841/10.034	
4 (50–75%)	2.555 (.099)	12,871	10.602/15.643	
5 (75–95%)	3.406 (.104)	30,144	24.582/36.929	

OR = odds ratio; SE = standard error.

Missing values excluded listwise. Nagelkerke's $R^2 = 0.084$.

** $P < .001$.

*95% CI for OR.

[†]Frequency scale 0–100%. Dependent variable: COC with a current partner (1 = Never, 2 = 5–25%, 3 = 25–50%, 4 = 50–75%, 5 = 75–95%, 6 = Always).

who are older, engage in heterosexual intercourse more often, and use face to face/female above and sitting/face-to-face positions more frequently and kneeling/rear entry less frequently are more likely to achieve orgasm during coitus with their partner. Existing research shows that in women, the frequency of orgasm is positively associated with increasing age.²⁸ More frequent use of positions with a woman on top has also been found to facilitate female orgasm.^{11,29} These positions allow women to take active role in intercourse and control the depth and rhythm of penetration. Higher perceived sexual arousability during stimulation of deep vagina has also been associated with greater vaginal orgasm capacity.³⁰ On the other hand, we also found that less frequent use of kneeling/rear entry position is associated with more frequent orgasm. This is consistent with results reported by Swieczkowski and Walker¹¹ who found a low frequency of orgasms during this position. In our sample, however, reported frequency of use of this position was high. Once again, as in oral-penis contact, the position received higher ratings of pleasurability in men than in women. Although our analyses were exploratory, further research is needed to explain the lower potential of kneeling/rear entry position for orgasm in women. Moreover, owing to relatively small effect sizes, we ought to be cautious in interpreting this finding. Different coital positions might have a similar facilitating effect on COC, and the results could be accounted for by women's higher tendency to achieve orgasm via different coital positions.

We are aware of several methodological shortcomings of our study. First of all, despite a large sample size, our results cannot be generalised to the whole population because the sampling was not representative. Our prevalence and frequency estimates could be influenced by the fact that we investigated respondents willing to participate in sex surveys, and the mean age of our sample suggests a higher representation of younger age cohorts. One could also criticise incompleteness of the list of sexual positions (both coital and noncoital) and practices we included in the study. For instance, existing research indicates increasing prevalence of anal sex in heterosexual repertoires (for a review, see the study by McBride and Fortenberry²). In a representative sample of Czech population, lifetime prevalence of heterosexual anal intercourse had increased between 1993 and 2008 to 16.6–19.7% among women and 15.7–25.3% among men.³¹ Moreover, side positions and further variations of the missionary position should be included in future research because earlier research indicates these are frequently used.^{11,12} Moreover, we did not map the use of multiple positions during one sexual encounter. Ideally, future research should explore a trajectory of positions used during usual sexual intercourse.

General data about the prevalence of sexual positions should also be explored in their connection to various other factors. For instance, we did not explore the differences in the use of particular sexual positions across age groups, although existing studies suggest that differences in sexual behavior between

various age groups do exist.^{4,7,12} Various studies suggest that the presence of pain with vaginal penetration,³² body mass index,³³ physical disability,³⁴ and pregnancy³⁵ influence the choice of sexual positions in couples and should be controlled for. Moreover, it is possible that the use of sexual positions varies between cultures, a subject which should be investigated by cross-cultural studies. Future studies could also map predictors of what kinds of positions a person prefers (and has greater COC from).

Although we examined associations between specific coital positions and COC, the dependent variable was assessed using just one item and reported in terms of percentage of sexual encounters resulting in female orgasm over the past 5 years with no further differentiation. Future studies should optimally investigate the rated orgasmic potential for each sexual position specifically. Moreover, we did not ask about concurrent manual stimulation of the clitoris during specific sexual positions, although women report they are more likely to reach orgasm when vaginal intercourse is concurrent with clitoral stimulation (for a review, see the study by Meston et al²⁵). Future research should also include or focus on homosexual men and women. To the best of our knowledge, the repertoire of sexual positions in homosexual individuals has not been explored yet. Although a study of Frederick et al³⁶ found that lesbian women report more frequent orgasms than heterosexual women do and that men (heterosexual and homosexual) report more frequent orgasms than lesbian women, this study did not investigate the link with particular sexual positions.

Despite these limitations, our study focused on an underexplored area, and we believe it brings a valuable contribution to scientific knowledge on the subject. Moreover, our results could be taken into consideration in actual sexual therapy practice. Data about the frequency of sexual positions and techniques used during the foreplay and sexual intercourse inform clinicians about existing sexual variety in a population. Our findings suggest that there are gender differences in the rated pleasurability of several sexual positions. This suggests it may be helpful to encourage couples to discuss their preferences of sexual positions in detail and perhaps try to introduce new sexual techniques in their repertoire. For example, gender disparity in sexual satisfaction in a couple could be at least in part due to differences in the rated pleasurability of some sexual positions and techniques used during the foreplay. We also believe that appreciation of the fact that sexual positions which women tend to find more pleasurable are related to women's orgasmic experience during coitus can be of use in sexual therapy practice and help partners achieve greater sexual pleasure, more frequent orgasm, and more general satisfaction in their lives.

CONCLUSION

The present study contributes to scientific knowledge of sexual behavior. It shows that the frequency of use of various sexual positions and techniques during foreplay varies and their rated pleasurability may differ between the sexes. Our results also

suggest a possible association between coital positions and female orgasmic potential during penile-vaginal intercourse. Admittedly, owing to relatively small effect sizes, these conclusions ought to be interpreted with caution. Nevertheless, we believe findings such as those reported here can stimulate subsequent research that would contribute to new approaches in sexual therapy and help improve sexual lives.

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STATEMENT OF AUTHORSHIP

Lucie Krejčová: Formal Analysis, Writing - Original Draft, Writing - Review & Editing, Funding Acquisition; Radim Kuba: Conceptualization, Methodology, Investigation, Project Administration, Writing - Review & Editing; Jaroslav Flegr: Conceptualization, Methodology, Investigation, Writing - Review & Editing; Kateřina Klapilová: Conceptualization, Methodology, Writing - Review & Editing.

REFERENCES

- Daniélou A. The complete kama sutra, the first unabridged modern translation of the classic Indian text. Rochester, VT: Inner Tradition; 1993.
- McBride KR, Fortenberry JD. Heterosexual anal sexuality and anal sex behaviors: a review. *J Sex Res* 2010;47:123-136.
- Bullough VL. Sexual variance in society and history. New York, NY: John Wiley & Sons; 1976.
- Herbenick D, Reece M, Schick V, et al. Sexual behavior in the United States: results from a national probability sample of men and women ages 14–94. *J Sex Med* 2010;7:255-265.
- Johnson AM, Mercer CH, Erens B, et al. Sexual behaviour in Britain: partnerships, practices, and HIV risk behaviours. *Lancet* 2001;358:1835-1842.
- Mosher WD, Chandra A, Jones J. Sexual behavior and selected health measures: men and women 15-44 years of age, United States, 2002. *Adv Data* 2005;362:1-55.
- de Visser RO, Smith AM, Rissel CE, et al. Sex in Australia: heterosexual experience and recent heterosexual encounters among a representative sample of adults. *Aust N Z J Public Health* 2003;27:146-154.
- Weiss P, Zvěřina J. Sexuální chování obyvatel v ČR V [Sexual behaviour in CZ, V]. Prague: CegeDim; 2014.
- Kinsey AC, Pomeroy WB, Martin CE. Sexual behaviour in the male. Philadelphia, PA: Saunders; 1948.
- Kinsey AC, Pomeroy WB, Martin CE, et al. Sexual behavior in the human female. Oxford: Saunders; 1953.
- Swieczkowski JB, Walker CE. Sexual behavior correlates of female orgasm and marital happiness. *J Nerv Ment Dis* 1978;166:335-342.
- Fugl-Meyer KS, Öberg K, Lundberg PO, et al. On orgasm, sexual techniques, and erotic perceptions in 18- to 74-year-old Swedish women. *J Sex Med* 2006;3:56-68.
- Eichel EW, De Simone Eichel J, Kule S. The technique of coital alignment and its relation to female orgasmic response and simultaneous orgasm. *J Sex Marital Ther* 1988;14:129-141.
- Pierce AP. The coital alignment technique (CAT): an overview of studies. *J Sex Marital Ther* 2000;26:257-268.
- Flegr J, Kuba R. The relation of toxoplasma infection and sexual attraction to fear, danger, pain, and submissiveness. *Evol Psychol* 2016;14.
- Kratochvíl S. Sex jako obohacení života. Sexuální trénink v sedmi lekcích. Praha: Grada Publishing; 2005.
- Cohen J. Statistical power analysis for the behavioral sciences. New York, NY: Routledge; 1988.
- Leichter JS, Chandra A, Liddon N, et al. Prevalence and correlates of heterosexual anal and oral sex in adolescents and adults in the United States. *J Infect Dis* 2007;196:1852-1859.
- Hite S. The hite report: a Nationwide Study of Female Sexuality. New York, NY: Seven Stories Press; 2004.
- Stone N, Hatherall B, Ingham R, et al. Oral sex and condom use among young people in the United Kingdom. *Perspect Sex Reprod Health* 2006;38:6-12.
- Haavio-Mannila E, Kontula O. Correlates of increased sexual satisfaction. *Arch Sex Behav* 1997;26:399-419.
- Forsberg M. Does pornography influence sexual activities? In: von Feilitzen C, Carlsson U, eds. Children in the new media landscape: games, pornography, perceptions. Goteborg: UNESCO International Clearinghouse on Children and Violence on the Screen; 2001. p. 159-161.
- Brody S, Weiss P. Vaginal orgasm is associated with vaginal (not clitoral) sex education, focusing mental attention on vaginal sensations, intercourse duration, and a preference for a longer penis. *J Sex Med* 2010;7:2774-2781.
- Mustanski BS. Getting wired: exploiting the Internet for the collection of valid sexuality data. *J Sex Res* 2001;38:292-301.
- Meston CM, Levin RJ, Sipski ML, et al. Women's orgasm. *Annu Rev Sex Res* 2004;15:173-257.
- Brody S. The relative health benefits of different sexual activities. *J Sex Med* 2010;7:1336-1461.
- Brody S, Costa RM. Vaginal orgasm is associated with indices of women's better psychological, intimate relationship, and psychophysiological function. *Can J Hum Sex* 2017;26:1-4.

28. Kontula O, Miettinen A. Determinants of female sexual orgasms. *Socioaffect Neurosci Psychol* 2016;6:31624.
29. King R, Belsky J. A typological approach to testing the evolutionary functions of human female orgasm. *Arch Sex Behav* 2012;41:1145-1160.
30. Brody S, Klapilova K, Krejčová L. More frequent vaginal orgasm is associated with experiencing greater excitement from deep vaginal stimulation. *J Sex Med* 2013;10:1730-1736.
31. Brody S, Weiss P. Heterosexual anal intercourse: increasing prevalence, and association with sexual dysfunction, bisexual behavior, and venereal disease history. *J Sex Marital Ther* 2011;37:298-306.
32. Rosen NO, Bergeron S, Lambert B, et al. Provoked vestibulodynia: mediators of the associations between partner responses, pain, and sexual satisfaction. *Arch Sex Behav* 2013;42:129-141.
33. Kaneshiro B, Jensen JT, Carlson NE, et al. Body mass index and sexual behavior. *Obstet Gynecol* 2008;112:586-592.
34. McCormick GP, Riffer DJ, Thompson MM. Coital positioning for stroke afflicted couples. *Rehabil Nurs* 1986;11:17-19.
35. Lee JT, Lin CL, Wan GH, et al. Sexual positions and sexual satisfaction of pregnant women. *J Sex Marital Ther* 2010;36:408-420.
36. Frederick DA, John HKS, Garcia JR, et al. Differences in orgasm frequency among gay, lesbian, bisexual, and heterosexual men and women in a US national sample. *Arch Sex Behav* 2018;47:273-288.