

## Original Article

# Health, Sexual Activity, and Sexual Satisfaction

Selected Results From the German Health and Sexuality Survey (GeSiD)

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## Summary

**Background:** Physical and mental health disorders can markedly affect sexual activity and sexual satisfaction. Until now, there has been a lack of representative data from the German population that could serve as a basis for demonstrating specific links between sexuality and health.

**Methods:** In the German Health and Sexuality Survey (GeSiD), 4955 men and women in a two-step stratified random sample drawn from local resident registration offices across Germany were surveyed by questionnaire. The response rate was 30.2%. The questions involved, among other things, the respondents' self-assessment of sexual activity and sexual satisfaction, general health status, and any chronic illnesses or disabilities.

**Results:** The percentage of respondents who reported having been sexually active with one partner in the past four weeks was highest among men aged 36 to 45 and women aged 26 to 35. In male respondents, the likelihood of having been sexually active in the past four weeks decreased from 79.1% to 59.0% and 30.1%, respectively, if they described their own health status as fair or bad compared with those in very good health. In female respondents the decrease was from 72.5% to 48.0% and 32.4%, respectively. A comparable association was found with self-reported chronic illnesses and disabilities that were perceived as impairing sexuality. Sexual satisfaction was present to a similar extent in all age groups.

**Conclusion:** Self-reported physical and mental illnesses are often associated with marked impairment of sexuality. Even illnesses without any immediately evident relation to sexuality often affect aspects of sexual health. It is, therefore, advisable for physicians to address their patients' sexuality routinely in everyday clinical practice.

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Physical and mental health disorders and the undesired side effects of their treatment can markedly affect human sexuality (1, 2). This holds for chronic diseases and disabilities as well. For certain diseases, the fact that they affect sexuality and the manner in which they do so are already well known; yet it was only in 2013 that the relation of sexuality to a broad spectrum of health-related variables was first studied in a major British sex survey, the Natsal-3 (National Survey of Sexual Attitudes and Lifestyles) (3). This study showed, among other things, that a poor state of health is negatively correlated with sexual activity and sexual satisfaction in all age groups.

An analysis of this type in Germany has not been possible until now, as data on sexuality in this country (as opposed to most other European countries) have been obtained only as part of a broad multi-topic survey (4), or else only in specific population groups or with respect to very specific issues (5, 6), rather than in a comprehensive survey intended to represent the entire population. This situation has changed. With the support of the German Federal Centre for Health Education (*Bundeszentrale für gesundheitliche Aufklärung*, BZgA), the Institute for Sex Research, Sexual Medicine, and Forensic Psychiatry of the University Medical Center Hamburg-Eppendorf has been able to carry out the German Health and Sexuality Survey (GeSiD). The GeSiD instrument, which comprises numerous topics related to sexuality (for details, see *eMethods*), can now shed light on numerous aspects of sexual health in Germany. The aim of the present partial analysis of data from GeSiD is to study the relationship between health (both physical and mental) and sexual activity as well as sexual satisfaction in Germany.

## Methods

### Data acquisition

4955 men and women were surveyed in the study. The participation rate was 30.2% (AAPOR [American Association for Public Opinion Research] response rate 4 [7]). These persons had been chosen by random sampling of data from local residents' registration offices across Germany, in a two-step process: 200 so-called sample points were chosen at random (Step 1), and then the address data of randomly sampled 18- to 75-year olds were retrieved at each sample point (Step 2). The

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survey was carried out from October 2018 to September 2019. Interviewers from KantarEmnid, a social-science survey institute, started each interview by questioning the respondent in person and entering the responses into a laptop computer taken along to the interview (computer-assisted personal interview, CAPI). The interviewer then lent the laptop to the respondent, who entered further responses into the device himself or herself (computer assisted self-interview, CASI); thus completing a considerable part of the questionnaire using CASI. All respondents gave written informed consent to participation.

The survey instrument, which had been developed and tested in a preliminary study (8), contained a total of 264 questions and question groups. Through the use of numerous filtering variables, the individual respondents were asked a varying number of questions, depending on their personal sexual and relationship experiences to date. As a result, the interviews varied considerably in length, from 19 to 208 minutes; the average length was 51 minutes.

The data set was weighted in two steps. First, a correction was made for the increased probability of selecting 18- to 25-year olds due to deliberate oversampling (design weight). Next, the coarsely representative sample was adapted to data on population structure from the 2017 microcensus, concerning sex, age, educational level, nationality, and region (adjustment weight). A comprehensive description of the methods and data weighting can be found in the *eMethods* section.

**Items used**

For the present analysis, we used two dependent variables. The first was sexual activity in the past four weeks, defined as one or more of the following activities with a partner of the opposite or same sex: vaginal intercourse, oral intercourse, anal stimulation, anal intercourse, and other genital contact (for a precise formulation of this item and the following items, and of their coding for the present analysis, see *eMethods*). The second dependent variable was satisfaction with one’s own sex life in the past twelve months.

The independent variables included, aside from age and sex, the respondents’ relationship status and relationship duration, classified in four groups (no relationship, relationship for up to two years, relationship for between two and five years, or relationship for more than five years); self-assessed general health status (very good, good, fair, bad); and self-reported presence of a chronic disease or disability that impairs sexuality in the respondent’s perception. We also looked at the total number of specific health problems, defined as the pooled score out of two series of pre-defined conditions or interventions (none, one or two). Further health-related variables that were considered included body-mass index (BMI), risky alcohol consumption as characterized by the AUDIT-C score (Alcohol Use Disorders Identification Test) (9), and either occasional or regular smoking.

All models were initially calculated with the respondents’ socioeconomic status (German Index of Socioeconomic Deprivation, GISD) and educational level taken into account. These two features, however, were found to have only slight effects and were not relevant confounders for the health variables that were the main objects of the study. They were therefore dropped from further consideration.

The GeSiD study was reviewed by the ethics committee of the Hamburg Psychotherapy Association (*Hamburger Psychotherapeutenkammer*) and ethical approval was granted (reference number 07/2018-PTK-HH).

**Statistical evaluation**

The evaluation of the stratified, clustered sample was carried out with the Complex Samples module of the IBM SPSS Statistics for Mac OS X data analysis software package (version 25.0, issued in 2017; Armonk, NY: IBM Corp.). The prevalence of each of the dependent variables “sexual activity” und “sexual satisfaction” (in percent, along with 95% confidence intervals) is reported by sex, age group, relationship status, and health characteristics. The corresponding denominators, i.e., the absolute number of cases for each of the percentages given, are reported as well. As a result of data weighting, individual cases affect the final calculation to varying extents, and thus the weighted and unweighted denominators may differ in individual subpopulations. With the aid of logistic regression, adjusted odds ratios (AOR) were calculated to adjust for possible associations between different demographic and health characteristics, e.g., the fact that older persons are also more likely to report health problems in general. All models were adjusted for age and relationship status; models investigating the effect of age and relationship status were also adjusted for the general health status. In this way, the AOR convey information about the connection between independent and dependent variables, while controlling for the effect of confounders (here: age, relationship status, and possibly health status).

**Representativeness and non-responder analysis**

Like other surveys, the GeSiD study is intended to represent the target group (here, German-speaking residents of Germany, aged 18 to 75) as accurately as possible. To assess the extent to which the large number of non-responders, in particular, may have systematically biased the data, the non-responders were briefly questioned to determine whether they differed from the responders in any basic demographic parameters. Responders and non-responders were found to be similar in age and sex distribution, nationality, and size of the community of residence; the remaining, small differences were correctable with the weighting procedure described above (for details, see *eMethods*).

**Results**

*Table 1* shows, as expected, that the respondents’ self-reported general health status worsened with

TABLE 1

**Self-reported health characteristics of the GeSiD respondents, by age group and sex (figures in %)**

Age (years)	18–25	26–35	36–45	46–55	56–65	66–75
<b>Men</b>						
<b>General health status</b>						
Very good	51.1 [45.8; 56.4]	39.7 [34.8; 44.9]	36.4 [30.5; 42.8]	19.7 [15.8; 24.3]	11.3 [8.3; 15.3]	13.1 [9.4; 18.0]
Good	39.3 [34.4; 44.5]	50.1 [45.1; 55.0]	55.1 [48.9; 61.2]	58.0 [52.8; 63.0]	52.2 [46.5; 57.9]	51.6 [45.5; 57.6]
Fair	7.7 [5.3; 11.1]	9.1 [6.6; 12.3]	7.6 [5.1; 11.3]	17.7 [13.5; 22.9]	28.7 [23.5; 34.5]	27.0 [20.9; 34.1]
Bad	1.9 [0.8; 4.4]	1.1 [0.5; 2.4]	0.9 [0.4; 2.2]	4.6 [2.6; 7.8]	7.8 [5.1; 11.8]	8.3 [5.2; 13.0]
Denominator, unweighted	388	538	379	362	375	285
Denominator, weighted	312	450	404	543	458	311
<b>Chronic disease or disability</b>						
None	88.0 [83.7; 91.2]	82.4 [78.3; 85.9]	80.6 [75.7; 84.7]	65.2 [59.0; 70.9]	60.1 [54.5; 65.5]	47.3 [40.3; 54.5]
Without impairment of sexuality	8.8 [6.1; 12.6]	14.7 [11.6; 18.5]	14.8 [11.0; 19.7]	26.1 [20.9; 32.0]	22.1 [17.7; 27.3]	26.8 [21.0; 33.5]
With impairment of sexuality	3.2 [1.6; 6.4]	2.8 [1.7; 4.8]	4.6 [2.9; 7.1]	8.8 [6.0; 12.7]	17.7 [13.8; 22.5]	25.8 [20.5; 32.0]
Denominator, unweighted	381	532	374	357	363	277
Denominator, weighted	304	442	398	533	442	301
<b>Number of specific health problems</b>						
0 specific problems	72.6 [67.3; 77.4]	71.1 [67.3; 74.7]	68.8 [62.8; 74.2]	52.6 [46.4; 58.8]	49.5 [43.6; 55.2]	45.1 [38.1; 52.3]
1 specific problem	21.8 [17.6; 26.7]	21.4 [18.3; 24.9]	22.6 [17.9; 28.1]	31.1 [25.6; 37.3]	28.0 [22.8; 33.8]	26.0 [20.7; 32.1]
≥ 2 specific problems	5.6 [3.3; 9.4]	7.5 [5.3; 10.5]	8.6 [5.8; 12.7]	16.3 [12.1; 21.6]	22.5 [17.5; 28.4]	28.9 [22.1; 36.8]
Denominator, unweighted	375	529	375	360	369	281
Denominator, weighted	300	438	399	538	452	305
<b>Women</b>						
<b>General health status</b>						
Very good	40.8 [35.6; 46.3]	37.6 [33.3; 42.1]	22.7 [18.3; 27.7]	23.7 [19.3; 28.7]	15.5 [12.2; 19.5]	6.3 [3.8; 10.3]
Good	46.1 [40.6; 51.6]	49.9 [45.2; 54.6]	57.3 [51.9; 62.6]	49.6 [43.8; 55.4]	50.7 [45.0; 56.5]	52.9 [45.4; 60.2]
Fair	11.2 [7.9; 15.7]	11.3 [8.7; 14.5]	16.7 [13.0; 21.1]	22.6 [18.0; 27.9]	26.4 [21.8; 31.5]	31.9 [25.9; 38.5]
Bad	1.9 [0.8; 4.6]	1.3 [0.6; 2.5]	3.3 [1.5; 7.1]	4.2 [2.6; 6.8]	7.4 [4.9; 10.9]	9.0 [5.7; 13.8]
Denominator, unweighted	376	561	433	504	492	238
Denominator, weighted	282	417	400	536	470	343
<b>Chronic disease or disability</b>						
None	82.7 [77.8; 86.6]	78.8 [75.0; 82.1]	76.4 [71.3; 80.9]	68.1 [62.7; 73.0]	57.8 [52.8; 62.7]	51.6 [44.9; 58.2]
Without impairment of sexuality	12.4 [9.3; 16.5]	14.6 [11.8; 18.0]	13.8 [10.5; 17.9]	17.0 [13.7; 20.9]	28.5 [24.6; 32.8]	32.3 [26.3; 39.0]
With impairment of sexuality	4.9 [3.0; 7.9]	6.6 [4.9; 9.0]	9.8 [6.9; 13.8]	14.9 [11.0; 19.9]	13.6 [10.3; 17.8]	16.1 [11.3; 22.3]
Denominator, unweighted	371	556	426	495	479	226
Denominator, weighted	277	413	391	528	459	326
<b>Number of specific health problems</b>						
0 specific problems	59.9 [54.3; 65.2]	47.0 [42.4; 51.6]	31.2 [26.4; 36.3]	30.9 [26.7; 35.5]	29.5 [24.7; 34.7]	21.0 [15.6; 27.6]
1 specific problem	25.7 [20.8; 31.3]	30.8 [27.0; 34.9]	36.8 [31.6; 42.3]	33.4 [29.1; 38.0]	29.5 [25.1; 34.3]	26.7 [20.9; 33.6]
≥ 2 specific problems	14.4 [10.6; 19.4]	22.2 [18.4; 26.5]	32.1 [27.1; 37.4]	35.7 [30.9; 40.8]	41.0 [35.7; 46.6]	52.3 [45.3; 59.2]
Denominator, unweighted	368	553	429	496	488	233
Denominator, weighted	275	406	394	522	468	340

95% confidence intervals are given in square brackets.

The number of specific health problems is defined as a grouped score of the following specific health conditions or interventions (ever experienced by the respondent): bladder surgery, genital surgery, abdominal surgery, hip or pelvis fracture, hip replacement, prostate enlargement, prostate surgery, hysterectomy, caesarean section, polycystic ovary disease; as well as the following specific health conditions (experienced in the past 12 months): back pain, neurological disease, cancer, thyroid disease, testicular or ovarian disease, pituitary gland disease, depression, other mental illness.

advancing age. The percentage of respondents reporting chronic diseases and disabilities that impair their sex lives increases with age. The same holds for the percentage of respondents reporting more than one specific health problem.

### Sexual activity in the past four weeks

The percentage of respondents who reported having been sexually active with a partner in the past four weeks was highest among men aged 36 to 45 and women aged 26 to 35 (*Table 2*). Sexual activity was lower in older age groups. The AOR show the effect of age remaining after relationship duration and health status have been controlled for. Relationship status and sexual activity were found to be associated, as expected; singles had significantly less sex in the four weeks before questioning than women and men who were in a relationship. Moreover, women who were in relationships of longer duration (>5 years) were less sexually active than women in relationships of shorter duration (<2 years), while no significant difference of this type was found in men.

A clear association was found between the respondents' health status and their sexuality. Those who described their health status as fair or bad were markedly less likely to have been sexually active in the past four weeks than those who described it as very good. In male respondents, the likelihood of having been sexually active in the past four weeks decreased from 79.1% to 59.0% and 30.1%, respectively, if they described their own health status as fair or bad compared with those in very good health. In female respondents the decrease was from 72.5% to 48.0% and 32.4%, respectively (for 95% confidence intervals, see *Table 2*). This remained the case after the data had been adjusted for age and relationship status. A similar association was found between sexual activity in the past four weeks and self-reported chronic illnesses or disabilities, provided that the respondents perceived these as impairing their sexuality.

The respondents were asked not only about their self-assessed health status and about chronic diseases and disabilities, but also about the self-reported presence or absence of a number of specific, serious health problems, e.g., cancer (for a detailed listing, see *eMethods*). A direct association with sexual activity in the past four weeks was found for only a few of these conditions (in men, prostate surgery, depression, and other mental illnesses; in women, abdominal surgery and neurological disease). However, the presence of more than one of these specific health problems was significantly associated with a lower degree of sexual activity in the past four weeks, at least in men (*Table 2*).

Gender-specific effects were seen for obesity, risky alcohol consumption, and smoking. Women with a BMI over 30 kg/m<sup>2</sup> were less sexually active than women of normal weight. On the other hand, women whose alcohol consumption was risky according to

AUDIT-C, and/or who smoked, were slightly more sexually active.

### Sexual satisfaction in the past twelve months

For many people, lack of sexual activity is a main reason for being dissatisfied with their sex life. Sexual activity, however, is no guarantee of sexual satisfaction. When we aimed to specifically address the question of sexual satisfaction or dissatisfaction, we limited the evaluation of data to those respondents who had in fact been sexually active in the past twelve months; in this way, we avoided wrongly classifying satisfaction or dissatisfaction with the mere fact of having been sexually active (or not) as sexual satisfaction or dissatisfaction in the sense that we mean, i.e., satisfaction or dissatisfaction with actual sexual activity. *Table 3* shows sexual satisfaction as a function of demographic features and health status. The first evident conclusion is that sexual satisfaction, unlike sexual activity, is not associated with age. Sexual satisfaction appears to be present to a similar extent in all age groups. On the other hand, relationship status and duration are, indeed, correlated with sexual satisfaction. Sexually active singles are markedly less satisfied with their sexuality than respondents in a steady relationship with a partner; among persons in steady relationships, sexual satisfaction declines with increasing duration of the relationship.

The associations between health characteristics and sexual satisfaction resemble those between health characteristics and sexual activity. Respondents who describe their health as only fair or bad, who define themselves as chronically ill or disabled, or who suffer from one or more of a list of specific health problems are more likely to be dissatisfied with their sexuality than those who say they are in better health. BMI and smoking do not display any association with sexual satisfaction. Respondents with risky alcohol consumption are less satisfied with their sexuality.

### Discussion

Age, relationship status, and general health status are strongly correlated with one another with respect to their effects on sexual activity (10). At the same time, however, our current findings reveal that each of these characteristics is associated with sexual activity independently of the other two. These findings differ from those of our own earlier Three-Generation Study, in which the effect of aging was no longer statistically significant when corrected for confounding by relationship duration (10)—although, in that study, the maximum age of the respondents was 60. On the other hand, sexual satisfaction displays no correlation with age, but it is indeed correlated with relationship status and health status.

In the present study, we were able to show, for the first time in a representative, nationwide sample of the German population, that self-reported physical and mental illness is often associated with marked impairment of the respondents' sex life. Here our findings are broadly in accordance with those of the

TABLE 2

**Sexual activity in the past four weeks: association with demographic features and health characteristics [95% confidence intervals]**

	Men				Women			
	Sexual activity in the past four weeks (in %)	Adjusted odds ratio (AOR)	p-value	Denominator, weighted	Sexual activity in the past four weeks (in %)	Adjusted odds ratio (AOR)	p-value	Denominator, weighted
Total	71.7 [69.5; 73.5]			2371	62.1 [59.7; 64.5]			2365
<b>Age group (years)</b>								
18–25	64.7 [59.8; 69.3]	1.00	< 0.001	286	68.8 [62.3; 74.6]	1.00	< 0.001	270
26–35	79.4 [75.3; 83.0]	1.29 [0.92; 1.82]		432	80.7 [76.4; 84.4]	1.23 [0.74; 2.04]		404
36–45	79.6 [74.8; 83.7]	1.08 [0.69; 1.71]		384	79.6 [75.1; 83.5]	0.96 [0.60; 1.57]		386
46–55	76.6 [71.2; 81.3]	0.92 [0.61; 1.43]		524	66.7 [61.1; 71.9]	0.52 [0.32; 0.87]		515
56–65	68.8 [63.3; 73.8]	0.65 [0.42; 1.01]		441	47.2 [41.8; 52.7]	0.24 [0.14; 0.41]		441
66–75	50.8 [44.3; 57.2]	0.26 [0.16; 0.41]		279	26.1 [20.1; 33.1]	0.11 [0.06; 0.19]		331
<b>Steady relationship</b>								
Yes, ≤ 2 years	92.0 [86.3; 95.4]	1.00	< 0.001	190	91.1 [85.6; 94.6]	1.00	< 0.001	180
Yes, > 2–5 years	92.2 [87.7; 95.2]	0.94 [0.40; 2.21]		237	90.6 [86.4; 93.6]	0.77 [0.37; 1.60]		248
Yes, > 5 years	81.0 [78.2; 83.5]	0.57 [0.30; 1.09]		1356	73.8 [70.8; 76.7]	0.48 [0.27; 0.86]		1324
No	33.6 [29.1; 38.3]	0.04 [0.02; 0.09]		563	15.3 [12.6; 18.5]	0.02 [0.01; 0.04]		595
<b>General health status</b>								
Very good	79.1 [75.4; 82.4]	1.00	< 0.001	638	72.5 [68.6; 76.0]	1.00	< 0.001	566
Good	75.0 [72.2; 77.6]	0.70 [0.49; 1.01]		1224	65.5 [62.3; 68.6]	0.97 [0.72; 1.31]		1194
Fair	59.0 [52.2; 65.5]	0.37 [0.24; 0.58]		388	48.0 [42.4; 53.6]	0.59 [0.39; 0.87]		478
Bad	30.1 [19.6; 43.4]	0.12 [0.05; 0.25]		96	32.4 [22.7; 43.9]	0.27 [0.15; 0.50]		108
<b>Chronic disease or disability</b>								
None	75.7 [73.1; 78.2]	1.00	< 0.001	1620	67.7 [64.8; 70.4]	1.00	0.010	1585
Yes, not impairing	69.0 [63.5; 74.0]	0.80 [0.56; 1.15]		451	52.0 [46.6; 57.3]	0.78 [0.58; 1.04]		463
Impairing	49.8 [41.9; 57.7]	0.34 [0.22; 0.54]		232	50.8 [42.7; 58.9]	0.55 [0.37; 0.82]		261
<b>Number of specific health problems</b>								
0 problems	75.8 [73.0; 78.3]	1.00	< 0.001	1369	67.3 [63.3; 71.1]	1.00	0.645	811
1 problem	71.8 [67.4; 75.8]	0.79 [0.58; 1.08]		594	63.3 [59.4; 67.0]	0.93 [0.70; 1.23]		718
≥ 2 problems	54.7 [47.6; 61.7]	0.41 [0.28; 0.61]		348	55.3 [50.9; 59.6]	0.85 [0.60; 1.20]		784
<b>Body mass index</b>								
Normal	70.4 [66.8; 73.8]	1.00	0.397	900	68.7 [65.8; 71.5]	1.00	0.026	1162
Underweight	41.6 [21.5; 64.8]	0.39 [0.13; 1.20]		24	63.2 [50.5; 74.3]	0.56 [0.28; 1.11]		61
Overweight	75.7 [72.4; 78.7]	1.04 [0.78; 1.38]		937	58.5 [53.3; 63.5]	0.78 [0.56; 1.08]		652
Obese	67.6 [62.3; 72.5]	0.95 [0.67; 1.33]		476	51.5 [45.8; 57.2]	0.65 [0.47; 0.90]		477
<b>Risky alcohol consumption</b>								
No	69.6 [66.6; 72.5]	1.00	0.072	1143	58.4 [54.9; 61.7]	1.00	0.002	1352
Yes	73.7 [70.2; 76.8]	1.31 [0.98; 1.75]		1112	68.7 [65.3; 71.9]	1.53 [1.17; 2.01]		880
<b>Smoking (occasional or regular)</b>								
No	70.8 [68.2; 73.2]	1.00	0.147	1470	59.9 [57.0; 62.7]	1.00	0.003	1629
Yes	73.1 [69.6; 76.4]	1.23 [0.93; 1.62]		871	67.6 [63.2; 71.7]	1.60 [1.17; 2.19]		729

Sexual activity was defined as any event involving one or more of the following activities with a partner of the same or opposite sex: vaginal intercourse, oral intercourse, anal intercourse, anal stimulation, other genital contact. The number of specific health problems is defined as a grouped score of the following specific diseases or interventions (ever experienced by the respondent): bladder surgery, genital surgery, abdominal surgery, hip or pelvis fracture, hip replacement, prostate enlargement, prostate surgery, hysterectomy, caesarean section, polycystic ovary disease; as well as the following specific diseases (experienced in the past 12 months): back pain, neurological disease, cancer, thyroid disease, testicular or ovarian disease, pituitary gland disease, depression, other mental illness. Risky alcohol consumption was defined as an AUDIT-C score (Alcohol Use Disorders Identification Test) above 3 (men) or above 2 (women). The body mass index was grouped as follows: normal, 18.5–25 kg/m<sup>2</sup>; underweight, <18.5 kg/m<sup>2</sup>; overweight, 25–30 kg/m<sup>2</sup>; obese, >30 kg/m<sup>2</sup>. All models were adjusted for age and relationship status. Models for the investigation of age and relationship status were additionally adjusted for the general health status.

TABLE 3

**Sexual satisfaction in the past 12 months (only among respondents that had sex during this time) [95% confidence interval]**

	Men				Women			
	Sexual activity in the past four weeks (in %)	Adjusted odds ratio (AOR)	p-value	Denominator, weighted	Sexual activity in the past four weeks (in %)	Adjusted odds ratio (AOR)	p-value	Denominator, weighted
Total	61.3 [58.6; 63.9]			1943	66.3 [63.8; 68.7]			1688
<b>Age group (years)</b>								
18–25	65.3 [59.7; 70.5]	1.00	< 0.183	212	70.8 [64.0; 76.8]	1.00	0.083	207
26–35	60.1 [55.1; 64.9]	0.70 [0.48; 1.02]		379	64.3 [59.7; 68.6]	0.76 [0.50; 1.16]		364
36–45	63.4 [57.1; 69.2]	0.89 [0.57; 1.37]		346	64.6 [58.6; 70.1]	0.88 [0.57; 1.36]		345
46–55	57.1 [50.5; 63.5]	0.74 [0.46; 1.19]		458	63.1 [57.6; 68.2]	0.90 [0.56; 1.44]		402
56–65	63.6 [57.1; 69.7]	1.08 [0.68; 1.71]		342	68.1 [60.5; 74.8]	1.15 [0.70; 1.88]		257
66–75	58.4 [50.1; 66.3]	0.83 [0.49; 1.43]		185	77.7 [66.1; 86.2]	1.95 [0.95; 4.03]		108
<b>Steady relationship</b>								
Yes, ≤ 2 years	83.6 [77.4; 88.4]	1.00	< 0.001	181	77.6 [70.8; 83.2]	1.00	< 0.001	166
Yes, > 2–5 years	70.2 [64.2; 75.5]	0.47 [0.28; 0.76]		229	73.8 [67.9; 78.9]	0.81 [0.52; 1.26]		242
Yes, > 5 years	61.9 [58.5; 65.3]	0.33 [0.21; 0.51]		1218	66.1 [62.9; 69.3]	0.56 [0.36; 0.86]		1132
No	36.2 [30.1; 42.7]	0.10 [0.06; 0.17]		293	41.9 [33.4; 51.0]	0.19 [0.11; 0.33]		144
<b>General health status</b>								
Very good	67.8 [62.9; 72.3]	1.00	< 0.001	559	73.7 [69.4; 77.7]	1.00	< 0.001	453
Good	61.0 [57.6; 64.3]	0.67 [0.52; 0.87]		1036	67.9 [64.3; 71.2]	0.70 [0.53; 0.91]		897
Fair	50.3 [43.7; 56.9]	0.41 [0.29; 0.59]		282	52.1 [45.7; 58.4]	0.34 [0.24; 0.50]		290
Bad	44.5 [27.2; 63.2]	0.36 [0.16; 0.80]		43	51.2 [33.1; 69.1]	0.32 [0.15; 0.71]		44
<b>Chronic disease or disability</b>								
None	63.7 [60.5; 66.9]	1.00	0.002	1374	68.7 [65.8; 71.4]	1.00	< 0.001	1209
Yes, not impairing	56.5 [50.6; 62.1]	0.73 [0.54; 0.99]		361	67.8 [61.9; 73.2]	0.94 [0.70; 1.26]		293
Impairing	45.5 [35.3; 56.0]	0.44 [0.28; 0.71]		145	44.6 [36.6; 52.8]	0.34 [0.24; 0.48]		163
<b>Number of specific health problems</b>								
0 problems	63.5 [60.3; 66.5]	1.00	0.017	1163	73.9 [69.8; 77.5]	1.00	< 0.001	615
1 problem	56.9 [51.3; 62.3]	0.75 [0.57; 0.99]		489	64.4 [59.8; 68.7]	0.63 [0.47; 0.85]		522
≥ 2 problems	56.3 [48.5; 63.7]	0.69 [0.49; 0.96]		242	58.3 [53.3; 63.0]	0.47 [0.35; 0.63]		519
<b>Body mass index</b>								
Normal	59.9 [56.0; 63.7]	1.00	0.842	712	66.1 [62.8; 69.2]	1.00	0.157	887
Underweight	67.8 [34.3; 89.5]	1.70 [0.50; 5.72]		16	77.1 [65.6; 85.6]	1.91 [1.07; 3.43]		46
Overweight	61.9 [54.5; 67.7]	1.03 [0.80; 1.33]		800	67.1 [62.0; 71.9]	1.03 [0.79; 1.34]		450
Obese	60.1 [53.7; 66.1]	1.08 [0.77; 1.50]		379	63.4 [57.0; 69.4]	0.87 [0.63; 1.20]		295
<b>Risky alcohol consumption</b>								
No	64.0 [60.2; 67.6]	1.00	0.011	914	69.1 [65.3; 72.7]	1.00	0.026	903
Yes	57.5 [53.8; 61.1]	0.75 [0.60; 0.94]		931	62.1 [58.2; 65.8]	0.75 [0.58; 0.97]		703
<b>Smoking (occasional or regular)</b>								
No	60.2 [56.8; 63.5]	1.00	0.122	1182	65.6 [62.5; 72.6]	1.00	0.178	1129
Yes	62.4 [58.1; 66.5]	1.22 [0.95; 1.55]		728	67.8 [62.6; 72.6]	1.22 [0.91; 1.63]		555

The sample was restricted to respondents who had had sex with at least one partner in the past 12 months. Sexual activity was defined as any event involving one or more of the following activities with a partner of the same or opposite sex: vaginal intercourse, oral intercourse, anal intercourse, anal stimulation, other genital contact. The number of specific health problems is defined as a grouped score of the following specific diseases or interventions (ever experienced by the respondent): bladder surgery, genital surgery, abdominal surgery, hip or pelvis fracture, hip replacement, prostate enlargement, prostate surgery, hysterectomy, caesarean section, polycystic ovary disease; as well as the following specific diseases (experienced in the past 12 months): back pain, neurological disease, cancer, thyroid disease, testicular or ovarian disease, pituitary gland disease, depression, other mental illness. Risky alcohol consumption was defined as an AUDIT-C score (Alcohol Use Disorders Identification Test) above 3 (men) or above 2 (women). The body mass index was grouped as follows: normal, 18.5–25 kg/m<sup>2</sup>; underweight, <18.5 kg/m<sup>2</sup>; overweight, 25–30 kg/m<sup>2</sup>; obese, >30 kg/m<sup>2</sup>. All models were adjusted for age and relationship status. Models for the investigation of age and relationship status were additionally adjusted for the general health status.

British Natsal study (3): a fair or bad self-assessed health status, a chronic disease or disability perceived as impairing sexuality, or (in men) the presence or two or more specific health problems was associated with a lower degree of sexual activity in the four weeks before taking the survey, as well as with lower sexual satisfaction. In other words, even diseases that have no immediately evident relation to sexuality often affect aspects of sexual health. Although we recognize that a cross-sectional analysis such as this one cannot, strictly speaking, resolve the question of causality, it seems reasonable to conclude that problems in physical and mental health cause a worsening of sexuality, rather than the other way around.

These findings have certain limitations. We ascertained the respondents' health status only by self-reporting. In future large-scale sex surveys, it would be desirable for at least a few aspects of health status to be ascertained by objectifying methods. Moreover, whenever an empirical study of sexuality is conducted, one must ask whether the findings are reliable. Even though our sample corresponds to the population at large in its main sociodemographic features, and our non-responder analysis does not indicate any large, systematic bias, we cannot rule out the possibility that the answers were biased with respect to sensitive sexual biographical traits.

Even allowing for these limitations, our findings imply that it would clearly be desirable for physicians to develop a greater sensitivity for sexual health in the broad sense of the term. Questions about sexuality should be asked routinely, not just with regard to sexually transmitted infections and sexual dysfunctions, but also in discussions of diseases and medications that can have adverse effects on sexuality or psychosocial wellbeing.

We know from multiple studies that sexuality is still dealt with too cursorily in medical education (11, 12), and that it often remains an unspoken taboo when patients are counseled by their physicians (13, 14). Physicians may find it just as difficult as their patients do to initiate a conversation about sexuality. In order to facilitate communication about sexuality in the doctor's office, the participants can be offered support. For example, written materials can be made available to medical practices which underscore the relevance of the subject through case illustrations and point the way to potential communication strategies. Support can also be offered with the aim of empowering the patients, i.e., enabling and encouraging them to talk with their physicians about impairments in their sex lives. Such offers need not be restricted to persons with known illnesses. They can be integrated into existing intervention and patient education programs that improve communication skills in general, thereby providing benefit to the individual even beyond his or her role as a patient.

The close links between health and sexuality that are revealed by our findings justify the designation of sexuality as an important topic in human health. It remains problematic that, with the present dearth of resources in

## Key messages

- The German Health and Sexuality Survey (GeSiD) is the first comprehensive sex survey conducted in Germany that is intended to be representative of the national population.
- Physical and mental illnesses can have marked adverse effects on sexual activity and sexual satisfaction.
- A bad or only fair health status, a chronic illness or disability that is perceived as impairing sexuality, or the simultaneous presence of more than one condition from a list of specific illnesses is associated with reduced sexual activity as well as with lower sexual satisfaction.
- Sexual health can thus be affected, not only by disorders of sexual function per se and by sexually transmitted infections, but also by illnesses without any immediately apparent connection to sexuality.

everyday medical practice, physicians may have only a limited ability to deal with additional matters beyond the ones with which they already must contend.

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The authors state that no conflict of interest exists.

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► **Supplementary material**

For eReferences please refer to:  
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eMethods, eTables:  
[www.aerzteblatt-international.de/20m0645](http://www.aerzteblatt-international.de/20m0645)

**CLINICAL SNAPSHOT**

**Psoriasiform Dermatitis During Infliximab Therapy for Ulcerative Colitis**



**Left lower leg** with extensive erythematous plaques and marked, firmly adherent desquamation.

A 40-year-old male patient presented to our emergency department due to painful and pruritic skin lesions on both lower legs of 12 days' standing. With the exception of ulcerative colitis, which had been diagnosed 9 years previously and was being treated at the time of presentation with infliximab (5 mg/kg body weight), the patient had no other pre-existing diseases. The skin lesions had become apparent approximately 5 weeks following the second infusion with infliximab. Histological analysis showed signs of psoriasis as well as mixed-cell superficial perivascular dermatitis. Psoriasiform dermatitis was diagnosed on the basis of the clinical picture and in view of the frequency of cutaneous side effects in TNF-alpha blockade. The skin lesions rapidly resolved under intensified local anti-inflammatory treatment. Infliximab was interrupted for 4 weeks and continued every 8 weeks thereafter. No recurrence of the skin lesions was observed. Psoriasiform skin lesions frequently develop during anti-TNF-alpha therapy. Although the pathomechanism has not been definitively established, Th1 and Th17 cytokines appear to play a key role. Discontinuation of TNF-alpha blockade is only rarely necessary.

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Supplementary material to:

## Health, Sexual Activity, and Sexual Satisfaction

Selected Results From the German Health and Sexuality Survey (GeSiD)

by Arne Dekker, Silja Matthiesen, Susanne Cerwenka, Mirja Otten, and Peer Briken

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## eMETHODS

Representative, population-based studies on sexual health in the adult population have for many years been conducted in a large number of European countries, in the USA and in Australia. They reveal a significant change in sexual behavior in the second half of the 20th century. These typically government-funded studies help to steer health policy measures and improve sex education and family planning services. For a long time, comprehensive population-based data on sexual behavior have been unavailable in Germany. The German Health and Sexuality Survey (GeSiD), the first nationwide study in this field, is designed to represent the 18- to 75-year-old, German-speaking, residential population of Germany. The method used is described in detail below. The GeSiD study was reviewed and approved by the ethics committee of the Hamburg Psychotherapy Association (reference number: 07/2018-PTK-HH).

### Sampling

The approaches to generate sex survey samples which are as representative as possible of the population concerned differ from country to country (6). The survey strategy depends not only on the available resources and the survey method used—for example, when deciding whether to use online, telephone, or address samples—but also on national peculiarities in the regulations for provision of administrative data. For instance, the Danish online study Sexus (e1) benefits from a public register of e-mail addresses. In the GeSiD interview study presented here, a special framework was created by the German residence registration system: While a residential address sample was used in the British Natsal survey (3), the generally accepted gold standard of sexual science survey research, the decentralized organization of the residence registration offices in Germany enabled the selection not just of addresses but of actual persons.

As is common practice with high-quality surveys in Germany, the GeSiD used a doubly stratified residence registration office sample. First, a total of 200 sample points, most of which were identical with one residence registration office, were randomly selected (stage 1). Next, at each of these sample points an average of 86 persons aged between 18 and 75 years were drawn from the residential registers (stage 2). In the gross sample, the proportion of 18- to 35-year-old men and women was intentionally increased (oversampling) to enable detailed analyses of this target group, which is of special importance for sexual health risk assessment.

### Conduct of the interviews

Once drawn, the address data were allocated to a total of 256 interviewers, who then collected the data between October 2018 and September 2019. A consortium of the social science survey institutes Kantar EMNID, Kantar Public, and Kantar Health was responsible for sampling and data collection (e2).

The target persons were first contacted by means of a letter informing them about the study and inviting them to participate. Compensation of €5 for reading the extensive information material was sent with the letter. The target persons could keep the money even if they decided not to participate. In 966 cases, however, the money was returned: either the target persons explicitly declined to accept it, or the letter could not be delivered to the addressee. Over the following weeks, the interviewers personally visited the target persons and requested their participation. Male interviewers visited male respondents and female interviewers called on female respondents. If a target person decided to participate, the interviews were conducted at their home at a time of their choice. Prior to the start of the interview, the respondents received

additional information about the study, anonymization, and data protection and gave, with their signature, their written informed consent to participation in the study. The interviews started with a computer-assisted personal interview (CAPI). The greater part of the data were subsequently collected in a computer-assisted self-interview (CASI) during which the respondents entered their answers on a laptop. During this process, the interviewers remained in the room, ready to answer any potential questions, but without looking at the answers. Once the self-completion segment was finished, the interviewers no longer had access to the data entered. Name and data of the respondents were separated immediately after the end of the interview to prevent re-identification of the respondent solely on the basis of the dataset. The mean adjusted interview duration was 50.9 minutes (median 48 minutes; 25<sup>th</sup> percentile 40 minutes; 75<sup>th</sup> percentile: 59 minutes). On completion of the interview, each participant received an additional allowance of €25. A total of 4 955 interviews were conducted in this manner. The participation rate was 30.2% (AAPOR response rate 4; [e3]) and the cooperation rate was 37.9%. The latter represents the proportion of interviews actually carried out at the homes of the addressees with whom there was at least one contact (AAPOR cooperation rate 4; [e3]).

### Survey instrument and items used

The GeSiD questionnaire is the revised version of a survey instrument which was developed in an extensive pilot study and tested on 1155 respondents (13). Different versions of the instrument are available for men and women. It comprises more than 260 questions and question complexes; however, depending on the respondents' previous sexual and relationship experiences, only some of these questions were asked. The topics covered included the following items:

- Life situation
- Knowledge of sexuality
- First sexual experience
- Sexuality in the current stable relationship or as a single
- Gender
- Sexual orientation
- Attitudes to sexuality
- Sexuality via digital media
- Various sexual experiences, including experience with specific sexual practices, masturbation, and prostitution
- General and sexual health

The survey instrument is available from the contributing authors. Except for the variable "gender" which was obtained from the residence registration offices, all variables offered the respondents the option to provide no information.

### Items used

#### Dependent variables

- Sexual activity in the past four weeks (yes/no) was constructed out of two variables and dichotomized: "If you now consider the period of the last four weeks: how many times in the last four weeks have you had sex with a man?" / "If you now consider the period of the last four weeks: how many times in the last four weeks have you had sex with a woman?" Here, "having sex" was defined as "any event involving one or more of the activities listed above (vaginal intercourse, oral intercourse, anal intercourse, anal stimulation, other genital contact)."
- Satisfaction with sex life in the past twelve months (yes/no) was constructed out of evaluations of the statement: "I am satisfied with my sex life overall." Responses 4 and 5 on a five-point Likert scale were taken as indicating satisfaction. Satisfaction with sex life was only asked about if the respondent reported that he or she had been sexually

active with a partner at least once with a male or female partner in the past twelve months.

#### Independent variables

- Age, in six groups (18–25, 26–35, 36–45, 46–55, 56–65, and 66–75 years), was constructed out of the response to the question, “How old are you?”
- Sex (man/woman): a dichotomous variable “sex” was used in the present analysis because this variable possesses a high explanatory power as a social structural category with respect to sexuality. The variable corresponds to the datum on sex that was received from the residents’ registration offices, and it was used to determine which version of the questionnaire would be given to the respondent (the version for men or the version for women) and the corresponding mode of filtering employed by the computer-assisted data entry mask. None of the residents’ registration offices reported the sex of any of the participants as “diverse” (a recently introduced category in Germany), as the law permitting this went into effect on 1 January 2019 and our coarse random sample had already been drawn by this date. Respondents whose experienced everyday gender did not correspond to the information provided by the registries had the option of changing the information at the start of the interview (and thus receiving the other version of the questionnaire), but, in fact, no respondent made use of this option. Even so, the man/woman dichotomy failed to reflect the fact that some of the respondents experienced their sex/gender as a more complex matter (e.g., as transgender, non-binary, gender-fluid, etc.), either temporarily or permanently, as well as the fact that, for some, the experienced everyday sex/gender did not correspond (or did not fully correspond) to the one stated on their birth certificate and/or recorded by the residents’ registration office. Thus, in some cases, the sex variable employed in this study failed to do justice to the sexual history and sexual experience of the individual. Yet, despite this, it remained an important analytical tool and enabled us to consider all of the respondents in the analysis.
- Relationship status and relationship duration, in four groups (no relationship, relationship  $\leq 2$  years, relationship  $> 2$ –5 years, relationship  $> 5$  years), was constructed out of two features: “Are you currently in a steady relationship?” (response options: “no,” “yes, with a man,” “yes, with a woman,” and “yes, with more than one person”), and, where appropriate, “How long have you been together with (...)?”, where the respondents were asked to mentally supply the name(s) of their current partner(s) in place of “(...)” (response option: time interval, in years and months).
- The subjective health status (very good, good, fair, bad) was assessed with the question, “How is your health in general?” The five response options were “very good,” “good,” “fair,” “bad” and “very bad.” The latter two options were grouped together for the analysis.
- Chronic diseases and disabilities were assessed with the question, “Do you suffer from a chronic disease or disability? If so, does the disease or disability impair your sex life?” The response options were; “no”; “yes, but it does not impair my sex life”; and “yes, and it does impair my sex life.”
- Number of specific health problems: the presence or absence of a list of diseases and/or interventions was asked about in two questions, with multiple options for the further characterization of positive responses:
  1. “Have you ever had any of the following diseases or operations?”  
Positive responses could be further characterized with the following: “bladder surgery,” “genital surgery,” “abdominal surgery,” “hip or pelvis fracture,” “hip replacement,” “enlarged prostate” (men

only), “prostate cancer” (men only), “prostate surgery” (men only), “hysterectomy” (women only), “caesarean section” (women only), “polycystic ovaries” (PCOS; women only).

2. “Have you been treated for any of the following diseases in the last 12 months?” Positive responses could be further characterized with the following: “back pain lasting three months or more,” “any neurological disease,” “cancer,” “thyroid disease,” “diseases of the testicles or ovaries,” “diseases of the pituitary gland,” “depression,” “any other type of mental illness.”

The number of conditions indicated in the responses to these two questions was tallied to construct a summed score, so that the feature “number of specific health problems” was assigned one of three values—“none,” “one,” or “two or more.”

- Alcohol consumption was assessed with the validated screening test AUDIT-C (Alcohol Use Disorders Identification Test). Scores above 2 (for women) or above 3 (for men) were held to indicate risky consumption.
- Cigarette smoking was assessed with the question, “Do you currently smoke?”
- The body-mass index (BMI) was calculated from the respondent’s self-reported height (“How tall are you?”) and weight (“How much do you weigh, in kilograms?”). The respondents were asked to enter their height, in centimeters, in a free-text field. The body weight in kilograms was grouped in 5-kilogram steps. The BMI was calculated with the mean value in each group (e.g., 52 kg for the group 50-54 kg). Analogously, the groups at either end (less than 50 kg, and 130 kg and above) were set to 47 kg and 132 kg, respectively.

### Data weighting and statistical analysis

First, the GeSiD data were weighted to correct the oversampling-related differences in selection probability between respondents in different age groups (design weight). Using a second weighting, these grossly representative data were adjusted to the data of the 2018 microcensus with regard to gender, age, educational attainment, nationality, and region (adjustment weight).

All steps of the data analysis were performed using the Complex Samples module of the data analysis software package IBM SPSS Statistics (Version 25.0, released in 2017; Armonk, NY: IBM Corp) to ensure that the stratification and clustering of the complex sample were taken into account.

### Representativeness and non-responder analysis

In common with other surveys, the GeSiD study attempts to get as close as possible to the ideal of representativeness for the target group—here, the German-speaking residential population aged between 18 and 75 years. Systematic losses due to refusal to participate raise the question of how representative the sample is and consequently to what extent it is possible to extrapolate the results of the GeSiD sample to the general population. In order to evaluate whether significant differences between responders and non-responders exist, which would be indicative of systematic bias, a brief non-responder survey was conducted. The data were collected in various ways:

- Personal contact by the interviewer (n = 2323)
- Telephone contact by the study hotline (n = 46)
- Contact by e-mail (n = 15)
- Contact by mail (n = 326)

After final adjustment, a total of 2681 (15.6% of the gross sample) short questionnaires completed by non-responders were included.

*eTable 1* shows a comparison of non-responders and responders (weighted and unweighted data). Overall, the demographic characteristics

of responders and non-responders match well. The already small differences between responders and non-responders are further reduced by applying the weights, which contribute to an increased representativeness of the GeSiD sample.

### Sample

*eTable 2* shows the demographic characteristics of the sample by sex and age groups.

eTABLE 1

**Demographic characteristics of the GeSiD participants by sex and age group (figures in %)**

Variable	Non-responders	Responders	Responders (weighted)
<b>Sex (in %)</b>			
Female	42.3	52.9	49.8
Male	57.7	47.1	50.2
<b>Age group (in %)</b>			
18–25	8.1	15.5	12.0
26–35	14.4	22.3	17.6
36–45	15.9	16.5	16.4
46–55	20.9	17.6	21.8
56–65	23.3	17.6	18.9
66–75	17.5	10.6	13.3
<b>Nationality (in %)</b>			
German	83.3	90.6	85.9
Foreign	12.4	9.4	14.1
Unknown	4.3		
<b>Population of BIK region of residence (in %)</b>			
More than 100,000	60.1	65.5	64.2
Less than 100,000	39.9	34.5	35.8

BIK region: city or town, with surrounding smaller communities (a derived entity that is used in Germany for sociological, economic, and geographic projects); GeSiD: German Health and Sexuality Survey.

eTABLE 2

**Further demographic characteristics of the GeSiD participants by sex and age group (figures in %)**

Sex	Men							Women						
Age (years)	18–25	26–35	36–45	46–55	56–65	66–75	Total	18–25	26–35	36–45	46–55	56–65	66–75	Total
<b>Marital status (%)</b>														
Unmarried	96.6	61.0	31.9	20.3	10.8	7.7	35.8	93.2	52.2	23.9	14.6	8.8	6.3	29.3
Married/registered partner	3.4	37.0	60.2	62.4	68.5	74.0	52.6	5.4	43.4	65.6	63.6	61.6	51.9	51.7
Widowed	0.0	0.0	0.0	0.3	3.5	5.3	1.3	0.0	0.7	0.3	3.2	10.3	25.3	6.4
Divorced	0.0	2.0	7.9	17.0	16.9	13.0	10.1	1.5	3.7	10.2	18.6	19.3	16.5	12.5
<b>Stable relationship (%)</b>														
No	52.9	26.1	20.0	17.2	17.3	16.9	23.7	35.9	17.9	13.5	19.3	28.1	40.1	24.7
Yes, opposite-sex partner	45.7	71.7	78.5	81.8	82.6	82.1	75.1	63.0	81.0	85.1	79.3	71.0	59.9	74.3
Yes, same-sex partner	1.4	2.0	1.3	0.8	0.1	0.9	1.1	0.9	0.9	1.4	1.4	0.9	0.0	1.0
Other / no response	0.0	0.2	0.2	0.2	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0
<b>Educational level (%)</b>														
Low	38.2	27.8	28.7	30.0	40.6	49.1	34.8	22.6	17.4	23.0	27.9	34.1	49.2	28.9
Middle	23.0	23.5	28.3	36.5	30.9	25.2	28.6	21.5	30.1	33.9	42.3	41.5	32.7	34.9
High	38.8	48.7	43.0	33.5	28.5	25.7	36.6	55.9	52.5	43.0	29.8	24.4	18.2	36.1
<b>Population of BIK region of residence (%)</b>														
> 500,000* <sup>1</sup>	23.9	27.2	30.7	25.9	18.5	22.6	24.9	29.5	31.7	31.3	24.8	20.5	26.0	26.9
> 500,000* <sup>2</sup>	9.6	8.8	8.3	10.9	10.4	12.6	10.0	8.5	7.6	8.0	11.4	9.5	7.4	8.9
100 000–499 999* <sup>1</sup>	14.9	17.6	12.0	11.9	11.0	12.1	13.2	18.2	15.0	11.8	16.1	11.5	15.0	14.4
10 000–499 999* <sup>2</sup>	14.7	13.2	13.8	15.7	16.0	15.5	14.8	14.1	13.0	13.9	14.1	19.5	16.1	15.2
50 000–99 999* <sup>1</sup>	2.1	3.1	3.4	2.4	2.0	2.4	2.6	2.2	2.6	2.7	2.7	2.3	3.1	2.6
50 000–99 999* <sup>2</sup>	9.0	9.3	5.9	9.1	10.3	9.2	8.9	4.9	8.3	10.3	8.4	7.2	5.0	7.6
20 000–49 999	13.8	8.5	10.5	9.8	12.3	10.3	10.7	11.4	9.8	10.9	10.1	13.7	11.8	11.3
5000–19 999	7.7	8.0	10.3	9.6	13.4	7.7	9.7	8.5	7.0	7.1	7.3	9.7	10.6	8.3
2000–4999	3.0	2.9	4.3	2.5	4.7	4.8	3.6	2.5	1.5	3.4	3.9	3.9	3.7	3.2
< 2000	1.3	1.3	0.8	2.3	1.5	2.8	1.7	0.2	3.4	0.7	1.3	2.1	1.3	1.6
<b>Sexual identity (%)</b>														
Heterosexual* <sup>3</sup>	92.8	88.3	92.3	95.1	92.7	88.3	92.9	86.8	91.9	93.7	90.7	89.9	93.8	91.2
Homosexual* <sup>3</sup>	1.6	1.9	2.9	2.0	0.3	1.2	1.7	0.9	0.9	1.4	1.2	0.4	0.0	0.8
Bisexual	1.1	0.5	1.2	0.8	1.2	0.3	0.9	5.3	3.5	0.7	1.4	0.5	0.0	1.7
Other / no response	4.5	3.0	3.6	2.1	5.9	10.1	4.6	6.0	3.6	4.0	6.1	9.3	6.2	6.2
<b>Denominator (absolute numbers)</b>														
Unweighted	389	538	382	366	376	285	2 336	377	565	434	504	498	241	2619
Weighted	312	450	409	546	460	311	2 487	283	423	402	536	474	349	2468

BIK region: city or town, with surrounding smaller communities (a derived entity that is used in Germany for sociological, economic, and geographic projects); GeSiD: German Health and Sexuality Survey.

\*<sup>1</sup> core area

\*<sup>2</sup> suburban to peripheral area

\*<sup>3</sup> mainly or exclusively