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Erectile Problems in Polish Straight, Bisexual, and Gay Men: Does Sexual Identity Really Matter?

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ABSTRACT

Erectile dysfunction (ED) is one of the most common sexual health diagnoses in men. Previous studies demonstrated that ED can be even more prevalent among sexual minority men. This study investigated whether sexual identity is related to erectile function (EF) and explored variables possibly contributing to the differences between Polish straight and sexual minority men. The study sample included 1,246 gay, 838 straight, and 535 bisexual men who participated in an online survey. First, the psychometric qualities of the IIEF-2-EF scale used in the study were examined through confirmatory and exploratory factor analysis; a correction to account for potential bias in the questionnaire was also applied. Next, a series of univariate and multivariable models accounting for predictors possibly contributing to the observed differences between the groups of men were conducted. It was demonstrated that gay and bisexual men were more likely to show poorer EF. However, as demonstrated in the subgroup of men who were in relationships, sexual identity lost its significance when the unique characteristics of minority men's sexuality (i.e., less focus on insertive penetrative sex in gay men and more frequent relational non-exclusivity in bisexual men) were controlled for. Erectile problems in minority men may benefit from clinical consideration in the unique context of their sexuality.

Introduction

Sexual dysfunctions (SD) constitute the most prevalent clinical problem in everyday sexological practice (Laumann et al., 1994, 1999; Simons & Carey, 2001). However, pertinent studies rarely explicitly take participants' sexual identity into account. A recent review of research on sexual health in gay and lesbian persons showed that sexual dysfunctions were investigated disproportionately less often as compared to other research questions, especially those focusing on HIV and STIs (Mijas et al., 2021).

One of the ongoing debates within the existing literature on SD concerns postulated differences related to the risk of erectile dysfunction/problems (ED/P) between straight and sexual minority men. Some studies suggested that ED/P could be more prevalent in the latter group (e.g., Grabski & Kasparek, 2017). The results were confirmed by a recent meta-analysis (Barbonetti et al., 2019), according to which gay men were 1.5 times more likely to report ED than straight men. However, this observation was based on only four studies, which shared some methodological limitations, such as relying on non-probability sampling methods and non-standardized indicators of sexual dysfunctions (Javaroni, 2019). Although one of these studies was population-based, it did not confirm the trend for gay men to be more at risk of developing an ED (Lau et al., 2006). Two other projects also failed to confirm this difference once the level of distress (Peixoto & Nobre, 2015) or the relational status (Breyer et al., 2010) were controlled for.

While the existence of this discrepancy is still open to debate, practitioners and researchers have theorized about possible underlying mechanisms. One of the candidates is minority stress with its direct and/or indirect (i.e., by affecting mental health, relationships, and intimacy) effect on sexual function. Another one is the specificity of gay men's sexual milieu, wherein potency and sexual performance are highly valued and thus contribute to increased exposure to competition and comparisons with other men. Together with a more common single status in a relationship and having more sexual partners, it may lead to increased levels of insecurity and performance anxiety (Grabski & Kasparek, 2017; McNally & Adams, 2001; Sandfort & de Keizer, 2001).

The research that aimed at searching for correlates of erectile problems in sexual minority men have pointed to: age (Bancroft et al., 2005; Hirshfield et al., 2010; Shindel et al., 2012; Vansintejan et al., 2013), voiding symptoms (Shindel et al., 2012), living with HIV (Hirshfield et al., 2010; Shindel et al., 2012), not being in a long-term relationship (Hirshfield et al., 2010; Shindel et al., 2012) or being in a long-term relationship (Vansintejan et al., 2013), prior use of erectogenic therapy (Shindel et al., 2012), not engaging in insertive anal intercourse (Shindel et al., 2012) or preference toward receptive and versatile sex role (Vansintejan et al., 2013), decreased satisfaction with sex life (Shindel et al., 2012), substance use and exposure to discrimination (Lau et al., 2008), frequency of

sexual intercourse (Vansintejan et al., 2013), other sexual difficulties including decreased libido, ejaculation problems, and anodyspareunia (Vansintejan et al., 2013), as well as performance anxiety (Bancroft et al., 2005).

Erectile function can also be influenced by a vast array of known medical factors (Porst, 2012; Wincze & Weisberg, 2015), some of which could be more prevalent in sexual minority men (e.g., depression, cardiovascular problems or diabetes, prescribed medication use; Lick et al., 2013).

It is also possible, however, that the estimates of the risk of ED in sexual minority men are biased due to inadequate methodologies; specifically due to the inability of the tools for measuring erectile function/dysfunction to adequately capture gay men's sexuality (Javaroni, 2019; Kiss et al., 2020). Emphasizing the importance of penetration or erectile rigidity per se, such measures may ignore the fact that gay men's sexuality is less penetration-centered, and that their sexual satisfaction may be contingent on these aspects to a lesser extent (Sandfort & de Keizer, 2001).

Given the above, the following observations can be made. First, the relationship between gay or bisexual identity and the risk of ED/P is undetermined. Second, even if such a link were established, the variables or mechanisms responsible for such association would not be fully understood.

Aims

The study aimed to critically add to the ongoing debate on the potential disparity between gay, bisexual, and straight men with regard to the risk of ED/P by answering the following research questions:

(1) Does sexual identity predict erectile function in Polish men?
(2) What are the possible variables underlying this association?

Method

Procedure and Study Design

The present analysis drew on a database obtained from a cross-sectional Internet study on the sexuality of Polish straight, gay, and bisexual men (N = 3,697). Its methodology was described in detail in our previous publications (e.g., Grabski et al., 2019). This cross-sectional study was carried out between June and September 2016 using the computer-assisted web interview method with a purposive sample of Polish adult straight, bisexual, and gay men. The inclusion criteria for this parent project were: (i) minimum age of 18 years; (ii) male gender; (iii) informed consent to participate expressed by clicking a button to confirm that the participant had read the provided information on the study; (iv) having past and/or current sexual contacts. The participants were recruited through announcements posted on health- and lifestyle-related websites, as well as via websites dedicated to non-heterosexual audiences. The research project was approved by the Bioethical Committee of the Jagiellonian University and meets the requirements of the Declaration of Helsinki.

Data Selection

The sample sizes in the final models were as follows: 2,619 for all men, of whom 1,595 were in long-term relationships. 1,781 men indicated gay and bisexual identities. The data selection process reduced the number of participants from the initial 3,697 in the parental database to the present 2,619 by the exclusion of men who did not report any sexual activity or sexual stimulation within 4 weeks preceding the study (n = 940) and the participants whose data were inconsistent or incomplete (n = 138).

Participants

Among the 2,619 participants, 838 identified as straight, 1,246 as gay, and 535 as bisexual. The majority (90%) of the sample was younger than 40 years (Me = 27, Q_{25} =23, Q_{75} = 34). The youngest respondents were 18. The oldest one was 80. Gay and bisexual men were slightly older compared to straight men (Me_{gay} = 28, Q_{25gay} =23, Q_{75gay} = 34, Me_{bi} = 29, Q_{25bi} =22, Q_{75bi} = 38 $Me_{straight}$ = 26 $Q_{25straight}$ =23, $Q_{75straight}$ = 32). The majority of straight (45%) and gay respondents (43%) lived in the largest Polish cities (> 500,000 residents). The majority of bisexual participants lived in smaller cities (44%, 20,000–500,000). Most of the respondents had some university experience (76% of straight, 66% of gay, and 61% of bisexual men), and did not experience financial problems on a daily basis (65% of straight, 58% of gay, and 58% of bisexual men). Compared to 84% of straight participants, approximately 52% of gay and bisexual men were in a long-term relationship. The median of current long-term relationship length was 3 years for the gay and straight respondents, and 5 years for the bisexual ones. The full sample characteristics are displayed in Table 1 (continuous variables) and Table 2 (categorical variables).

Measures

Erectile Function Measurement

To measure the erectile function in the study participants, a 6-item (items no. 1, 2, 3, 4, 5, 15) erectile function (EF) subscale/domain from the IIEF-2 (International Index of Erectile Function version 2) scale was used (Pfizer Inc, 2007). The IIEF is a standard measure widely used in the assessment of sexual function in men (Rosen et al., 1997). The original version of the scale did not account for sexual identity, and the language used in the definition of "sexual intercourse" implied sexual contacts with women. The second version of the scale (Pfizer Inc, 2007), which was used in our study, was adapted for use in sexual minority men. The change to the primary version, however, was minor and involved replacing "vaginal penetration" with "sexual penetration" in the definition of "sexual intercourse." The participants assess how relevant the items are to them on a 5-point Likert-type scale; the maximum score for the EF domain is 30, with a greater score indicating better EF. The scale was primarily intended for use in clinical settings, so "no sexual contact" or "no sexual stimulation" would score "0", thus lowering the final score. Because the sample was not recruited in a clinical context, it was possible that due to choice or the lack of opportunity within the 4 weeks preceding the

Table 1. Sample characteristics: continuous variables.

	Straight (n = 838)			Gay (n = 1246)			Bisexual (n = 535)			Effect size
	Mean (SD)	Median	Range	Mean (SD)	Median	Range	Mean (SD)	Median	Range	
DEMOGRAPHICS										
Age	28.12 (7.34)	26	18–73	29.33 (8.49)	29	18–80	31.2 (10.85)	29	18–70	$F_{(2, 2616)} = 20.59$, $p < .001$, eta = .01
RELATIONSHIPS										
Duration of the relationship in years (formal or informal)	4.77 (5.00)	3	0.08–36	4.51 (4.96)	3	0.08–41	7.56 (8.33)	5	0.08–45	$F_{(2, 1592)} = 29.55$, $p < .001$, eta = .04
SEXUAL LIFE										
Sexual Quality of Life	80.94 (21.59)	89.09	0–100	75.22 (24.58)	81.82	0–100	74.69	23.68	0–100	$F_{(2, 2616)} = 17.91$, $p < .001$, eta = .01
IIEF-2-Erectile Function	27.02 (4.43)	29	3–30	23.20 (6.27)	25	5–30	24.83 (5.78)	27	4–30	$F_{(2, 2616)} = 114.81$, $p < .001$, eta = .08
R-IIEF-2-Erectile Function	3.57 (0.76)	3.77	0–4.28	3.10 (0.72)	3.21	0.18–4.28	3.19 (0.91)	3.22	0.27–4.28	$F_{(2, 2616)} = 75.15$, $p < .001$, eta = .05
Variety of sexual activities	8.44 (0.96)	9	1–11	8.95 (1.41)	9	2–11	9.59 (1.77)	10	1–11	$F_{(2, 2616)} = 115.94$, $p < .001$, eta = .08
Number of sexual partners (last 4 weeks)	1.14 (0.63)	1	1–12	1.91 (2.23)	1	1–45	1.87 (2.56)	1	1–50	$F_{(2, 2616)} = 41.96$, $p < .001$, eta = .03
MINORITY STRESS										
Internalized Homophobia	-	-	-	14.42 (5.64)	13	9–36	19.08 (6.68)	18	9–36	$t_{(1757)} = 15.00$, $p < .001$, d = 0.78
Expectations of Rejection	-	-	-	13.18 (4.30)	13	6–24	12.71 (4.76)	12	6–24	$t_{(1757)} = 2.04$, $p < .001$, d = 0.11
Identity concealment	-	-	-	14.70 (5.84)	14	6–30	17.40 (5.79)	18	6–30	$t_{(1757)} = 8.73$, $p < .001$, d = 0.45
Sexual Minority Negative Events	-	-	-	11.73 (7.94)	10	1–60	8.03 (6.77)	6	1–48	$t_{(1757)} = 9.23$, $p < .001$, d = 0.49

study, some men may have had no sexual contacts. They were excluded from the analyses. To reduce possible bias related to the use of this standard erectile function measure in a sample composed of participants of different sexual identities, a validation and an adaptation of the EF subscale were conducted. The proceedings and the results thereof are presented in Supplementary Materials 1. The resultant revised version of the IIEF-2-EF subscale (R-IIEF-2-EF) was then used in all the analyses. In the present study, Cronbach's alpha coefficient of reliability for the R-IIEF-2-EF was .80 for the whole sample and .78, .78, and .82 for straight, gay, and bisexual men, respectively.

Explanatory Variables' Measurement

The data were collected by means of a questionnaire developed for the parent study. This questionnaire included single- and multiple-choice questions, as well as some open-ended and closed questions. It was assessed by a group of 6 competent judges (2 gay men, 2 straight men, 1 sexologist, and 1 methodologist; no bisexual men for the task were found). Their feedback, which pertained to linguistic aspects of the questionnaire (e.g., overly academic or medical language), redundant items (in relation to the study's aims), and lacking content (e.g., civil unions reference in an item concerning the form of relationship), informed the final version of the survey. The data collected for the present analysis included: sexual identity (i.e., self-identification as straight, bisexual, or gay); demographic data (age, size of place of residence, education, financial situation); relationships (status of the relationship, duration of the current long-term relationship, and the partner's gender, sexual contacts outside the current long-term relationship); lifestyle (current physical activity – a closed question with "yes" or "no" answers: *Do you do any sports?* was asked – and the current use of alcohol, nicotine, and illicit drugs – closed general questions with "yes" or "no" answers on the use of substances were asked, and no specific list of illicit substances was supplied); health problems and illnesses (cardiovascular, diabetes, prostate, thyroid gland, hyperprolactinemia, hyperlipidemia, HIV/AIDS, depression, anxiety disorders, regular use of prescription medications – closed general questions with "yes" or "no" answers on the presence of a diagnosis and/or treatment of an illness were asked); sexual life (the number of sexual partners in the last four weeks, performance anxiety, the variety of sexual activities, i.e., the number of different sexual activities a respondent was ever engaged in, chosen from a preconceived list, the top three most pleasurable sexual activities, indicated as such individually by all respondents, based on the same list) (see Table 2 with the categorical descriptive characteristics for the list of activities).

The choice of the variables was based both on previous research on erectile problems in sexual minority men and on the clinical knowledge about factors influencing erectile function in various male groups. Additionally, for exploratory purposes, a "pleasure with penetration" variable was computed using the information on the three most pleasurable sexual activities provided by the study participants. Each participant was assigned one of three possible values: 0 if neither vaginal, insertive oral nor insertive anal penetration had been indicated

by that participant as one of the top three favorite sexual activities, 1 if one of those activities had been chosen and 2 if two or three of the listed activities had been indicated as one of the top three favorite sexual activities.

Sexual Minority Stress

To measure minority stress processes, the Sexual Minority Stress Scale (SMSS) was used (for details, see, Iniewicz et al., 2017). The SMSS is based on Meyer's conceptual framework and model (Meyer, 2003). It consists of the following four subscales measuring proximal and distal minority stressors: *internalized homophobia* with 10 items rated on a scale from 1 to 4, measuring the extent to which a person rejects, avoids, or feels discomfort with their sexual orientation; *expectations of rejection*, with 6 items rated on a scale from 1 to 4, measuring the extent to which a person expects rejection from others based on their sexual orientation; *identity concealment*, with 6 items rated from 1 to 5, measuring the frequency with which a person conceals their sexual orientation from others; *sexual minority negative events*, which contains a list of 22 prejudice events experienced before the age of 18 years, at home or school, and after the age of 18, with each instance awarded a point; additional 4 events are listed separately, contributing to the maximum score of 70 points.

Analyses

Sexual Identity and Its Relation to Erectile Function

To check the statistical significance of sexual identity as a predictor of erectile function, a series of univariate analysis models with pre-selected variables based on the literature review and clinical experience was computed. Because the dependent variable's distribution was strongly skewed to the left, a generalized linear model with negative binomial distribution with identity link function and robust standard errors was required.

Having eliminated the statistically non-significant predictors from the univariate analyses, multivariable models for the three groups were constructed. Group 1: all participants (n = 2,619); Group 2: only the participants in long-term relationships (n = 1,595); Group 3: only gay and bisexual participants (n = 1,759). For each of the three groups, generalized linear models were calculated with identity link function and robust standard errors. In Group 2, additionally, a stepwise regression analysis was performed (Supplementary Materials 2). In Group 3, minority stress processes were included in the multivariable model (Table 6). These analyses aimed to examine the associations between erectile function and the variables that are unique to sexual minority men (i.e., the characteristics of relationships and minority stress processes). Finally, the interaction of gay and bisexual identities with performance anxiety was introduced into the model together with demographic variables and relational status to investigate the possible explanatory role of performance anxiety in EF discrepancies between different sexual identities.

Again, a generalized linear model with a negative binomial distribution, identity link function, and robust standard errors was created. The interactions were introduced as products of both variables (Supplementary Materials 2).

Table 2. Sample characteristics: categorical variables.

	Straight (n = 838)		Gay (n = 1246)		Bisexual (n = 535)		Effect size
	%	n	%	n	%	n	
DEMOGRAPHICS							
Place of residence							chi2 (4) = 38.44, p = < .001, V = .09
<20,000	18.4	154	16.5	206	25.2	135	
20,100–500,00	36.4	305	40.1	500	43.9	235	
>500,100	45.2	379	43.3	540	30.8	165	
University experience							chi2 (2) = 38.36, p < .001, V = .12
No	23.9	200	33.5	417	38.9	208	
Yes	76.1	638	66.5	829	61.1	327	
Financial difficulties							chi2 (2) = 12.83, p = .002, V = .07
No	65.4	548	58.1	724	57.9	310	
Yes	34.6	290	41.9	522	42.1	225	
RELATIONSHIPS							
Long-term relationship							chi2 (2) = 242.77, p < .001, V = .30
No	16.4	137	48.2	600	47.7	255	
Yes	83.7	701	51.9	646	52.3	280	
Male partner							chi2 (2) = 1313.91, p < .001, V = .90
No	98.3	689	1.1	7	67.9	190	
Yes	1.3	9	98.9	639	32.1	90	
Sexual contacts outside the relationship							chi2 (2) = 242.77, p < .001, V = .30
No	92.1	645	70.4	455	49.8	131	
Yes	7.6	53	29.6	191	53.2	149	
LIFESTYLE							
Physical activity							chi2 (2) = 74.33, p < .001, V = .17
No	42.7	358	61.3	764	58.9	315	
Yes	57.3	480	38.7	482	41.1	220	
Regular use of alcohol							chi2 (2) = 21.99, p < .001, V = .09
No	54.0	449	62.6	779	65.2	346	
Yes	46.0	383	37.4	465	34.8	185	
Regular use of nicotine							chi2 (2) = 36.31, p < .001, V = .12
No	72.5	607	60.1	747	61.5	327	
Yes	27.5	230	40.0	497	38.5	205	
Regular use of illicit drugs							chi2 (2) = 9.98, p = .007, V = .06
No	91.0	757	94.5	1,174	93.6	494	
Yes	9.0	75	5.5	68	6.4	34	
HEALTH PROBLEMS AND ILLNESSES							
Cardiovascular diseases							chi2 (2) = 37.03, p = .014, V = .12
No	89.1	747	81.6	1,017	77.2	413	
Yes	10.9	91	18.4	229	22.8	122	
Diabetes							chi2 (2) = 10.54, p = .005, V = .06
No	96.2	806	93.4	1,164	92.3	494	
Yes	3.8	32	6.6	82	7.7	41	
Prostate diseases							chi2 (2) = 2.99, p = .224, V = .03
No	95.7	802	94.2	1,174	93.8	501	
Yes	4.3	36	5.8	72	6.2	33	
Thyroid diseases							chi2 (2) = 14.45, p = .001, V = .07
No	95.7	802	91.6	1,141	91.7	489	
Yes	4.3	36	8.4	105	8.3	44	
Hyperprolactinemia							chi2 (2) = 5.58, p = .061, V = .05
No	96.7	810	94.8	1,181	94.2	504	
Yes	3.3	28	5.2	65	5.8	31	
Hyperlipidemia							chi2 (2) = 13.59, p = .001, V = .10
No	92.6	776	90.2	1,124	86.5	463	
Yes	7.4	62	9.8	122	13.5	72	
HIV or AIDS							chi2 (2) = 23.47, p < .001, V = .09
No	96,9	812	91.6	1,140	93.3	498	
Yes	3.1	26	8.4	104	6.7	36	
Depression							chi2 (2) = 23.33, p < .001, V = .10
No	90.7	760	82.6	1,029	87.3	467	
Yes	9.3	78	17.4	217	12.7	68	
Anxiety disorders							chi2 (2) = 27.32, p < .001, V = .10
No	90.8	761	83.0	1,034	87.9	470	
Yes	9.2	77	17.0	212	12.2	65	
Regular use of prescription medications							chi2 (2) = 48.55, p < .001, V = .14
No	85.4	716	72.5	903	77.4	414	
Yes	14.6	122	27.5	343	22.6	121	

(Continued)

Table 2. (Continued).

	Straight (n = 838)		Gay (n = 1246)		Bisexual (n = 535)		Effect size
	%	n	%	n	%	n	
SEXUAL LIFE							
Performance anxiety							
No	71.4	598	64.2	800	64.9	347	chi2 (2) = 12.48, p = .002, V = .07
Yes	28.6	240	35.8	446	35.1	188	
Masturbation[a]							
No	73.2	613	61.7	769	66.0	353	chi2 (2) = 29.31, p < .001, V = .11
Yes	26.9	225	38.3	477	34.0	182	
Passionate kiss on the lips[a]							
No	79.5	666	57.6	718	72.2	386	chi2 (2) = 115.59, p < .001, V = .21
Yes	20.5	172	42.4	528	27.9	149	
Kissing different parts of a partner's body[a]							
No	85.1	713	83.3	1,038	84.5	452	chi2 (2) = 1.25, p =.534, V = .02
Yes	14.9	125	16.7	208	15.5	83	
Vaginal sex[a]							
No	15.9	133	99.7	1,242	61.7	330	chi2 (2) = 1552.40, p < .001, V = .77
Yes	84.1	705	0.3	4	38.3	205	
Anal sex (insertive)[a]							
No	80.6	675	54.4	678	58.5	313	chi2 (2) = 155.42, p < .001, V = .244
Yes	19.5	163	45.6	568	41.5	222	
Anal sex (receptive)[a]							
No	99.1	830	52.4	653	65.4	350	chi2 (2) = 525.51, p < .001, V = .45
Yes	1.0	8	47.6	593	34.6	185	
Oral sex (insertive)[a]							
No	27.3	229	55.5	691	45.1	241	chi2 (2) = 160.90, p < .001, V =.25
Yes	72.7	609	44.5	555	55.0	294	
Oral sex (receptive) [a]							
No	93.7	785	2.8	35	12.2	65	chi2 (2) = 1989.81, p < .001, V = .87
Yes	6.3	53	97.2	1,211	87.9	470	
Oral stimulation of the genitals of a female partner[a]							
No	4.3	36	67.3	838	23.6	126	chi2 (2) = 902.39, p < .001, V = .59
Yes	95.7	802	32.7	408	76.5	409	
Hand stimulation by the partner[a]							
No	1.8	15	7.1	89	7.1	38	chi2 (2) = 31.70, p < .001, V = .10
Yes	98.2	823	92.9	1,157	92.9	497	
Hand stimulation of the partner[a]							
No	2.9	24	8.3	103	7.7	41	chi2 (2) = 26.11, p < .001, V = .10
Yes	97.1	814	91.7	1,143	92.3	494	
Pleasure with penetration (ref = 0)							
No activities	3.2	27	32.5	405	15.3	82	chi2 (2) = 530.40, p < .001, V = .32
One activity	27.0	226	44.5	555	42.2	226	
Two or three activities	69.8	585	23.0	286	42.4	227	

[a]the answer "yes" = the activity was chosen as one of the top 3 favorite sexual activities

All analyses were performed via Stata software (the "glm" command; StataCorp, 2021).

Results

The Univariate Analyses

In the univariate models, compared to straight men, the quality of erection in the gay (IRR = .87, p < .001) and bisexual (IRR = .89, p < .001) men was significantly reduced. The associations were also significant across the wide range of investigated variables. The following factors were found to be related to better erectile function: university experience (IRR = 1.07, p < .001), place of residence (IRR = 1.04, p < .05), long-term relationship (IRR = 1.12, p < .001), physical activity (IRR = 1.07, p < .001), variety of sexual experience (IRR = 1.01, p < .01), and "pleasure with penetration" with one insertive penetrative activity listed among the top three

(IRR = 1.16, p < .001) and with two or three activities listed among the top three most pleasurable sexual activities (IRR = 1.25, p < .001). Other factors, such as age (IRR = .99, p < .001), financial difficulties (IRR = .94, p < .001), relationship duration (IRR = .995, p< .001) sexual contacts outside the relationship in one (IRR = .88, p < .001) or both (IRR = .91, p < .001) partners, somatic problems, specifically, cardiovascular disease (IRR = .93, p < .001), diabetes (IRR = .94, p < .05), hyperlipidemia (IRR = .95, p < .01), mental health problems, specifically, depression (IRR = .92, p < .001), anxiety disorders (IRR = .94, p < .001), regular use of prescription medications (IRR = .92, p < .001), and performance anxiety (IRR = .79, p < .001), were related to reduced erectile function. In the case of gay and bisexual men, the proximal minority stress processes (i.e., internalized homophobia [IRR = .996, p < .001], expectations of rejection [IRR = .99, p < .001] and identity concealment [IRR = .99, p < .001]), were related to poorer erectile function. For details, see Table 3.

Table 3. Erectile function in the univariate analyses.

Variables	IRR
SEXUAL IDENTITY (ref = straight)	
Gay	0.87***
Bisexual	0.89***
DEMOGRAPHICS	
Age	0.99***
Place of residence (ref = <20,000)	
20,100–500,000	1.03*
>500,000	1.04*
University experience (ref = no university experience)	1.07***
Financial difficulties	0.94***
(ref = no difficulties)	
RELATIONSHIPS	
Long-term relationship (ref = single)	1.12***
Duration of the relationship	0.995***
(formal or informal in years)	
Male partner (ref = female)	1.00
Sexual contacts outside the relationship	
One partner	0.88***
Both partners	0.91***
LIFESTYLE	
Physical activity	1.07***
Regular use of alcohol	1.02
Regular use of nicotine	0.98
Regular use of illicit drugs	1.03
HEALTH PROBLEMS AND ILLNESSES	
Cardiovascular diseases	0.93***
Diabetes	0.94*
Prostate diseases	0.96
Thyroid diseases	0.97
Hyperprolactinemia	0.98
Hyperlipidemia	0.95**
HIV or AIDS	0.98
Depression	0.92***
Anxiety disorders	0.94***
Regular use of prescription medications	0.92***
SEXUAL LIFE	
Performance anxiety	0.79***
Variety of sexual activities	1.01**
Number of sexual partners (4 weeks)	0.99
Top 3 most pleasurable sexual activities	
Masturbation	0.92***
Passionate kiss on the lips	0.95***
Kissing different parts of a partner's body	0.96**
Vaginal sex	1.14***
Anal sex (insertive)	1.05***
Anal sex (receptive)	0.93***
Oral sex (insertive)	1.10***
Oral sex (receptive)	0.88***
Oral stimulation of the genitals of a female partner	1.10***
Hand stimulation by the partner	1.15***
Hand stimulation of the partner	1.16***
Pleasure with penetration (ref = 0 activities)	
One activity	1.16***
Two or three activities	1.25***
MINORITY STRESS	
Internalized Homophobia	0.996***
Expectations of Rejection	0.99***
Identity concealment	0.99***
Sexual Minority Negative Events	1.00

* p < .05, ** p < .01, *** p < .001, IRR = incidence rate ratio

The Multivariable Analyses

In Group 1, compared to straight men, gay and bisexual men were – again – characterized by significantly lower levels of erectile function (IRR = .81, p < .001 and IRR = .83, p < .001, respectively) even when controlling for all the variables that significantly predicted EF in the univariate analyses.

Similarly, "pleasure with penetration" with one insertive penetrative activity listed among the top three (IRR = 1.30, p < .001) and with two or three activities listed among the top three most pleasurable sexual activities (IRR = 1.43, p < .001), long-term relationship (IRR = 1.13, p < .01), and variety of sexual activities (IRR = 1.05, p < .001) were found to be linked to better EF. At the same time, performance anxiety (IRR = .51, p < .001), regular use of prescribed medication (IRR = 0.89, p < .05), and age (IRR = .98, p < .001) decreased erectile quality. For details, see Table 4.

The analyses in Group 2 revealed that when controlling for demographic variables, relationships characteristics, and preference for sexual penetration, minority sexual identities no longer significantly predicted erectile function (Table 5). This was further investigated by means of a stepwise regression analysis, which identified the following variables as responsible for the effect: (1) sexual contacts outside the relationship (with the category of "no such contacts" as a point of reference) for bisexual respondents and (2) pleasure with penetration (with the category of "no insertive penetration activities" as the point of reference) for gay respondents (Supplementary Materials 2).

The additional role of minority stress processes in gay and bisexual men was confirmed for identity concealment (IRR = .99, p < .05; Table 6).

The interactions of gay and bisexual identities with performance anxiety did not significantly predict erectile function, so the assumption pertaining to greater significance of performance anxiety for erectile function in sexual minority men was not confirmed (Supplementary Materials 2).

Discussion

This study aimed to investigate whether gay or bisexual identities negatively predict erectile function and to identify the variables that may be responsible for this association.

It was demonstrated that both gay and bisexual identities were indeed related to poorer erectile function in both the univariate and multivariable analyses. In the latter case, the variables that are known to have been linked to erectile function and that proved to be significantly related to it in the univariate analyses were controlled for. These variables may differ in prevalence and/or significance depending on the sexual identity of the subjects. Two groups of these variables can be distinguished. The first is health-related and includes cardiovascular diseases, diabetes, depression, and the use of prescription medication, which – consistently with the previous research on minority populations (Lick et al., 2013) – were more prevalent in this study's gay and bisexual samples. The second group is related to sexual life and consists of such variables as the number of sexual partners, patterns of sexual activity, and performance anxiety, which – as suggested by the existing data (Grabski & Kasparek, 2017; McNally & Adams, 2001; Sandfort & de Keizer, 2001) – differed in straight, bisexual, and gay samples in this study. Furthermore, in line with the reasonable expectation that men of different sexual identities should differ with regard to the preference for

Table 4. Erectile function in multivariable analyses.

Variables	IRR
SEXUAL IDENTITY (ref = straight)	
Gay	0.81***
Bisexual	0.83***
DEMOGRAPHICS	
Age	0.98***
Place of residence (ref = <20,000)	
20,000–500,000	1.08
>500,000	1.06
University experience (ref = no university experience)	1.06
Financial difficulties (ref = no difficulties)	0.94
RELATIONSHIPS	
Long-term relationship (ref = single)	1.13**
LIFESTYLE	
Physical activity	1.07
HEALTH PROBLEMS AND ILLNESSES	
Cardiovascular diseases	0.98
Diabetes	0.95
Hyperlipidemia	1.02
Depression	0.93
Anxiety disorders	1.05
Regular use of prescription medications	0.89*
SEXUAL LIFE	
Performance anxiety	0.51***
Variety of sexual activities	1.05***
Top 3 most pleasurable sexual activities	
Masturbation	0.88**
Passionate kiss on the lips	1.02
Kissing different parts of a partner's body	0.96
Anal sex (receptive)	0.93
Oral sex (receptive)	1.02
Oral stimulation of the genitals of a female partner	0.94
Hand stimulation by the partner	1.02
Hand stimulation of the partner	0.94
Pleasure with penetration (ref = 0)	
One activity	1.30***
Two or three activities	1.43***
Constant	3.44***

* p < .05, ** p < .01, *** p < .001, IRR = incidence rate ratio

Table 5. Erectile function in men in long-term relationships.

Variables	IRR
SEXUAL IDENTITY (ref = straight)	
Gay	0.81
Bisexual	1.05
DEMOGRAPHICS	
Age	0.97***
Place of residence (ref = <20,000)	
20,000–500,000	1.09
>500,000	1.04
University experience (ref = no university experience)	1.15**
Financial difficulties (ref = no difficulties)	0.90*
RELATIONSHIPS	
Duration of the relationship in years (formal or informal)	1.02**
Gay # Duration of the relationship	0.99
Bisexual # Duration of the relationship	0.97**
Male partner (ref = female)	1.13
Sexual contacts outside the relationship (ref = no contacts)	0.58***
Gay # Sexual contacts outside the relationship	1.45*
Bisexual # Sexual contacts outside the relationship	1.73**
SEXUAL LIFE	
Pleasure with penetration (ref = 0)	
One activity	1.43***
Two or three activities	1.80***
Constant	3.62***

* p < .05, ** p < .01, *** p < .001, IRR = incidence rate ratio

insertive penetrative sex (Breyer et al., 2010; Sandfort & de Keizer, 2001), the preference was also controlled for and was found to be less pronounced in this study's gay and bisexual men.

Despite these attempts to delineate differing variables and despite the additional use of the revised IIEF-2-ED subscale aimed at reducing the biases stemming from the differences in sexual expression between different sexual identities, the gay and bisexual identities prevailed as significant predictors of the EF.

This led to a conclusion that either there are other explanatory variables, which were not taken into account, or that the corrections made to counteract the bias inherent in the assessment of erectile function in minority men in this study were insufficient.

One of the candidate variables, as suggested by some previous studies and clinical literature, was minority stress. According to Meyer (2003), it is unique, chronic, socially based, and additive to common general stressors. The model distinguishes two basic groups of stress processes – the distal, which operate from the outside of an individual (e.g., prejudice events), and the proximal, which exert their influence from the inside of an individual. The latter – internalized homophobia (or biphobia), expectation of rejection, and concealment – are thought to be the products of distal social attitudes, which gain psychological importance through cognitive appraisal. Both the distal and proximal minority stress processes have been demonstrated to be related to a whole range of adverse health outcomes (Hatzenbuehler & Pachankis, 2016; Herek et al., 1999), including sexual health and satisfaction (Grabski et al., 2019). Indeed, in this study, all the proximal processes were negatively related to erectile function in the univariate analyses, and the identity concealment remained significant in the multivariable analyses, albeit with a small effect size. This intuitive result is consistent with previous research (Kuyper & Vanwesenbeeck, 2011). Indeed, it seems reasonable to expect that anxiety-related psychological and physiological arousal may interfere with sexual performance at least in some men (Bancroft, 1999; Barlow, 1986; Tripodi et al., 2012).

In its essence, sexuality is highly relational – to some point, it is realized in relationships with other people, and it is the quality of those relationships that influences sexual performance and satisfaction (Tripodi et al., 2012). Long-term relationships are unique in the sense that they present both the challenges and assets to achieving satisfying sexual life and functioning (McWhirter & Mattison, 1982, 1984; Perel, 2006; Schnarch, 2009). Moreover, minority men are less likely to remain in long-term relationships (which this study also confirmed) and the relational dynamics in their case may also differ in some respects from the relational dynamics of straight men. A good example of such difference is relational and sexual exclusiveness, with gay couples more often living, accepting, and doing well in non-exclusive arrangements than their straight counterparts (Ritter & Terndrup, 2002). This study's

Table 6. Erectile function and the minority stress.

Variables	IRR
SEXUAL IDENTITY (ref = gay)	
Bisexual	1.07
DEMOGRAPHICS	
Age	0.98***
Place of residence	
(ref = <20,000)	
20,000–500,000	1.08
>500,000	1.02
University experience	1.05
(ref = no university experience)	
Financial difficulties	0.94
(ref = no difficulties)	
RELATIONSHIPS	
Long-term relationship	1.14**
(ref = single)	
LIFESTYLE	
Physical activity	1.09*
HEALTH PROBLEMS AND ILLNESSES	
Cardiovascular diseases	0.97
Diabetes	0.89*
Hyperlipidemia	1.06
Depression	0.93***
Anxiety disorders	1.05**
Regular use of prescription medications	0.90***
SEXUAL LIFE	
Performance anxiety	0.52***
Variety of sexual activities	1.05**
Top 3 most pleasurable sexual activities	
Masturbation	0.88*
Passionate kiss on the lips	0.98
Kissing different parts of a partner's body	0.94
Anal sex (receptive)	0.91
Oral sex (receptive)	1.02
Oral stimulation of the genitals of a female partner	0.84
Hand stimulation by the partner	1.03
Hand stimulation of the partner	0.91
Pleasure with penetration	
(ref = 0)	
One activity	1.27***
Two or three activities	1.35***
MINORITY STRESS	
Internalized Homophobia	0.997
Expectations of Rejection	0.99
Identity concealment	0.99*
Constant	3.62***

* p < .05, ** p < .01, *** p < .001, IRR = incidence rate ratio

results confirm that gay and bisexual men were in non-exclusive relationships more often than straight men. Taken together, these facts formed the rationale for the exploration of erectile function solely in the group of men being in long-term relationships.

In the analyses that controlled for the aforementioned unique relational and sexual characteristics, both the gay and bisexual identities lost their statistical significance as predictors of erectile function. The two variables identified in the stepwise analyses were sexual non-exclusiveness in bisexual men and the preference for penetration in gay men.

On the one hand, relational non-exclusivity may expose sexual minority men to higher levels of performance anxiety and – although it is more prevalent and accepted among minority men – it may still carry culturally conditioned meanings (e.g., infidelity), thus interfering with sexual function. On the other hand, as suggested by Morin (2010), "the Naughtiness Factor," which is a process of transforming prohibition into erotic fuel, may actually be related to improved erectile function at least in some men. The relational non-exclusivity may also be adaptive for some bisexual men who may try to navigate their diverse sexual desires in a heteronormative world by, for example, maintaining long-term relationships (perhaps "heterosexual"), and, at the same time, having satisfying same-sex sexual activity outside these relationships (Castro, 2021). The current study lends support to the latter possibility, as it was the bisexual men who had the longest intimate relationships and seemed to have benefited from relational non-exclusivity in terms of their erectile performance.

Intriguingly, controlling for the preference for penetration yielded different results when performed in the group of men in long-term relationships and the group of all men in the study. The fact that the gay identity lost its predictive value in the former instance may point to the diversified "mechanisms" behind gay men's preferences. Despite the paucity of research data, it seems logical to assume that in long-term relationships, built on trust and engagement, the lack of preference for insertive penetrative sex is more often related to the "true" preference and non-penetrative and/or receptive activities are more prevalent, in accordance with an individual's preferred sexual script. Conversely, men who are not in committed relationships may more often cope with "real" erectile problems by avoidance and rationalization. This statement would need further support in future studies.

Another issue that needs to be considered is the R-IIEF-2-EF subscale. Even though efforts were made to reduce the impact of "penetration-centrism" of the original IIEF-2-EF subscale, there is a distinct possibility that the assessment of erectile function in the minority men was biased. The study employed the SQoL-M (Sexual Quality of Life Scale–Men) to validate and correct the IIEF-2-EF (Supplementary Materials 1), which seemed reasonable, as sexual quality of life is an important area of interventions. Sexual quality of life has been shown to be impacted by erectile function, and the SQoL-M was designed to capture the associations between sexual problems and their treatment and sexual satisfaction (Abraham et al., 2008; Sanchez-Fuentes et al., 2013). On the other hand, an opposite argument can be made. Being broader than functional efficiency, sexual satisfaction encompasses feelings and thoughts about an individual's sex life. It is also influenced by a broad range of variables, with sexual function being one of them. Furthermore, the SQoL-M was not designed with sexually diverse men in mind. It is, therefore, possible that even the adjusted R-IIEF-2-EF subscale may have limited accuracy when applied to sexual minority men. Moreover, the scale has no items directly pertaining to distress, even though this particular quality is crucial for a phenomenon to be classified as a clinical problem or a disorder. It is possible that it was devised as a "penetration-centric" measure assuming that poorer erectile performance in terms of its mechanics will inevitably lead to discomfort or distress. This may not be true in at least one subgroup of gay men – men with a preference for the receptive role during sexual contacts or, as it was phrased in this study, with low "pleasure with penetration" rates.

Altogether, the results suggest that sexual identity is not inherently related to erectile function, but rather that some unique features of gay and bisexual men's sexuality (i.e., its

diversity, flexibility, being less reliant on penetration, and relational non-exclusivity) could influence this relationship as could the inadequacies of the standard measures.

Limitations, Strengths, Generalizability, and Conclusions

The limitations of our study include: 1) non-probability sampling method: young, educated city-dwellers were over-represented as a result of convenience sampling and the online nature of the survey method; these demographic characteristics could have influenced the men's sexuality and openness about sexual lives; 2) the retrospective method of data collection, which inevitably must have led to biases in reconstructing past events; 3) the use of the R-IIEF-2-EF subscale, based on the standard IIEF-2-EF instrument, which was not devised to capture the unique features of minority men's sexuality and was lacking items directly pertaining to distress, which, in turn, could have not been overcome despite the efforts to validate and adjust the scale using the SQoL-M; and 4) the exclusion of men with "no sexual contact/stimulation" within the past 4 weeks, which could have resulted in a loss of an unknown proportion of men with "true" ED/P.

Despite the above-mentioned limitations, the study presents considerable strengths: 1) the sample size is relatively large; 2) and it comes from an understudied Central-European context; 3) the study enabled a comparison of men of diverse sexual identities with the use of the same instruments; 4) including a wide range of variables known to influence erectile function.

Although sampling limitations affect the generalizability of the results of this study, it is worth noting that projects aiming at analyzing complex relations between variables should not necessarily rely on representative samples.

The study shows that: 1) sexual identity may be related to erectile function in Polish men, but this relationship may be shaped by the character of minority men's sexuality (less reliance on penetration) and relationships they form (the prevalence of non-exclusive relationships), which seem particularly valid for men in long-term relationships; 2) the standard instruments measuring erectile quality, such as the IIEF-2-EF subscale, require adjustments, but even the adjusted versions should be used with recognition of their limitations – their use should not be completely dismissed in projects aiming to compare men of diverse sexual identities.

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References

Abraham, L., Symonds, T., & Morris, M. F. (2008). Psychometric validation of a sexual quality of life questionnaire for use in men with premature ejaculation or erectile dysfunction. *The Journal of Sexual Medicine*, 5(3), 595–601. https://doi.org/10.1111/j.1743-6109.2007.00749.x

Bancroft, J. (1999). Central inhibition of sexual response in the male: A theoretical perspective. *Neuroscience and Biobehavioral Reviews*, 23(6), 763–784. https://doi.org/10.1016/S0149-7634(99)00019-6

Bancroft, J., Carnes, L., Janssen, E., Goodrich, D., & Long, J. S. (2005). Erectile and ejaculatory problems in gay and heterosexual men. *Archives of Sexual Behavior*, 34(3), 285–297. https://doi.org/10.1007/s10508-005-3117-7

Barbonetti, A., D'Andrea, S., Cavallo, F., Martorella, A., Francavilla, S., & Francavilla, F. (2019). Erectile dysfunction and premature ejaculation in homosexual and heterosexual men: A systematic review and meta-analysis of comparative studies. *The Journal of Sexual Medicine*, 16(5), 624–632. https://doi.org/10.1016/j.jsxm.2019.02.014

Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology*, 54(2), 140–148. https://doi.org/10.1037//0022-006x.54.2.140

Breyer, B. N., Smith, J. F., Eisenberg, M. L., Ando, K. A., Rowen, T. S., & Shindel, A. W. (2010). The impact of sexual orientation on sexuality and sexual practices in North American medical students. *The Journal of Sexual Medicine*, 7(7), 2391–2400. https://doi.org/10.1111/j.1743-6109.2010.01794.x

Castro, A. (2021). Stories told together: Male narratives of non-monogamous bi+ and heterosexual men. *Archives of Sexual Behavior*, 50(4), 1461–1477. https://doi.org/10.1007/s10508-021-02008-6

Grabski, B., & Kasparek, K. (2017). Sexual problems in homo- and bisexual men–the context of the issue. *Psychiatria Polska*, 51(1), 75–83. https://doi.org/10.12740/PP/61799

Grabski, B., Kasparek, K., Müldner-Nieckowski, Ł., & Iniewicz, G. (2019). Sexual quality of life in homosexual and bisexual men: The relative role of minority stress. *The Journal of Sexual Medicine*, 16(6), 860–871. https://doi.org/10.1016/j.jsxm.2019.03.274

Hatzenbuehler, M. L., & Pachankis, J. E. (2016). Stigma and minority stress as social determinants of health among lesbian, gay, bisexual, and transgender youth: Research evidence and clinical implications. *Pediatric Clinics of North America*, 63(6), 985–997. https://doi.org/10.1016/j.pcl.2016.07.003

Herek, G. M., Gillis, J. R., & Cogan, J. C. (1999). Psychological sequelae of hate-crime victimization among lesbian, gay, and bisexual adults. *Journal of Consulting and Clinical Psychology*, 67(6), 945–951. https://doi.org/10.1037//0022-006x.67.6.945

Hirshfield, S., Chiasson, M. A., Wagmiller, R. L., Jr., Remien, R. H., Humberstone, M., Scheinmann, R., & Grov, C. (2010). Sexual dysfunction in an internet sample of U.S. men who have sex with men. *The Journal of Sexual Medicine*, 7(9), 3104–3114. https://doi.org/10.1111/j.1743-6109.2009.01636.x

Iniewicz, G., Sałapa, K., Wrona, M., & Marek, N. (2017). Minority stress among homosexual and bisexual individuals—from theoretical concepts to research tools: The Sexual Minority Stress Scale. *Archives of Psychiatry and Psychotherapy*, 3, 69–80. https://doi.org/10.12740/APP/75483

Javaroni, V. (2019). Editorial comment: Erectile dysfunction and premature ejaculation in homosexual and heterosexual men: A systematic review and meta-analysis of comparative studies. *International Brazilian Journal of Urology*, 46(4), 667–668. https://doi.org/10.1590/S1677-5538.IBJU.2020.04.11

Kiss, M. J., McDonagh, L. K., Sparks, B., Hamp, T., & Morrison, T. G. (2020). Accurately assessing gay men's erectile functioning: A critique of the International Index of Erectile Function (IIEF) use with gay men. *Journal of Sex Research*, 58(5), 589–598. https://doi.org/10.1080/00224499.2020.1811195

Kuyper, L., & Vanwesenbeeck, I. (2011). Examining sexual health differences between lesbian, gay, bisexual, and heterosexual adults: The role of sociodemographics, sexual behavior characteristics, and minority stress. *Journal of Sex Research*, 48(2–3), 263–274. https://doi.org/10.1080/00224491003654473

Lau, J. T. F., Kim, J. H., & Tsui, H. Y. (2006). Prevalence and factors of sexual problems in Chinese male and females having sex with the same-sex partner in Hong Kong: A population-based study. *International Journal of Impotence Research*, 18(2), 130–140. https://doi.org/10.1038/sj.ijir.3901368

Lau, J. T., Kim, J. H., & Tsui, H. Y. (2008). Prevalence and sociocultural predictors of sexual dysfunction among Chinese men who have sex with men in Hong Kong. *The Journal of Sexual Medicine*, 5(12), 2766–2779. https://doi.org/10.1111/j.1743-6109.2008.00892.x

Laumann, E. O., Gagnon, J. H., Michael, R. T., & Michaels, S. (1994). *The social organization of sexuality. Sexuality practices in the United States*. University of Chicago Press.

Laumann, E. O., Paik, A., & Rosen, R. C. (1999). Sexual dysfunction in the United States: Prevalence and predictors. *JAMA*, 281(6), 537–544. https://doi.org/10.1001/jama.281.6.537

Lick, D. J., Durso, L. E., & Johnson, K. L. (2013). Minority stress and physical health among sexual minorities. *Perspectives on Psychological Science: A Journal of the Association for Psychological Science*, 8(5), 521–548. https://doi.org/10.1177/1745691613497965

McNally, I., & Adams, N. (2001). Psychosexual issues. In C. Neal & D. Davies (Eds.), *Issues in therapy with lesbian, gay, bisexual and transgender clients* (pp. 83–102). Open University Press.

McWhirter, D. P., & Mattison, A. M. (1982). Psychotherapy for gay male couples. In J. C. Gonsiorek (Ed.), *Homosexuality and psychotherapy: A practitioner's handbook of affirmative models* (pp. 79–91). Haworth Press.

McWhirter, D. P., & Mattison, A. M. (1984). *The male couple*. PrenticeHall.

Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin*, 129(5), 674–697.

Mijas, M., Grabski, B., Blukacz, M., & Davies, D. (2021). Sexual health studies in gay and lesbian people: A critical review of the literature. *The Journal of Sexual Medicine*, 18(6), 1012–1023. https://doi.org/10.1016/j.jsxm.2021.02.013

Morin, J. (2010). *Anal pleasure & health. A guide for men, women, and couples* (4th revised ed.). Down Three Press.

Muthén, L. K., & Muthén, B. O. (1998-2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.

Peixoto, M. M., & Nobre, P. (2015). Prevalence of sexual problems and associated distress among gay and heterosexual men. *Sexual and Relational Therapy*, 30(2), 211–225. https://doi.org/10.1080/0092623X.2014.918066

Perel, E. (2006). *Inteligencja erotyczna* [Maiting in captivity. Reconciling the erotic + the domestic]. Społeczny Instytut Wydawniczy Znak.

Pfizer Inc. (2007). *IIEF-15 (version 2) – Poland/Polish*. Retrieved November 1, 2014, from https://www.pfizerpatientreportedoutcomes.com

Porst, H. (2012). Erectile dysfunction (ED). In H. Porst & Y. Reisman (Eds.), *The ESSM syllabus of sexual medicine* (pp. 433–533). Medix Publishers.

Ritter, K. Y., & Terndrup, A. I. (2002). *Handbook of affirmative psychotherapy with lesbians and gay men*. The Guilford Press.

Rosen, R. C., Riley, A., Wagner, G., Osterloh, I. H., Kirkpatrick, J., & Mishra, A. (1997). The International Index of Erectile Function (IIEF): A multidimensional scale for assessment of erectile dysfunction. *Urology*, 49(6), 822–830. https://doi.org/10.1016/S0090-4295(97)00238-0

Sanchez-Fuentes, M. D. M. M., Santos-Iglesias, P., & Sierra, J. C. (2013). A systematic review of sexual satisfaction. *International Journal of Clinical Health Psychology*, 14(1), 67–75. https://doi.org/10.1016/S1697-2600(14)70038-9

Sandfort, T. G. M., & de Keizer, M. (2001). Sexual problems in gay men: An overview of empirical research. *Annual Review of Sex Research*, 12, 93–120.

Schnarch, D. (2009). *Intimacy and desire. Awaken the passion in your relationship*. Beaufort Books.

Shindel, A. W., Vittinghoff, E., & Breyer, B. N. (2012). Erectile dysfunction and premature ejaculation in men who have sex with men. *The Journal of Sexual Medicine*, 9(2), 576–584. https://doi.org/10.1111/j.1743-6109.2011.02585.x

Simons, J. S., & Carey, M. P. (2001). Prevalence of sexual dysfunctions: Results from a decade of research. *Archives of Sexual Behavior*, 30(2), 177–219. https://doi.org/10.1023/A:1002729318254

StataCorp. (2021) . *Stata statistical software: Release 17*.

Tripodi, F., Silvaggi, C., & Simonelli, C. (2012). Psychology of sexual response. In H. Porst & Y. Reisman (Eds.), *The ESSM syllabus of sexual medicine* (pp. 86–139). Medix Publishers.

Vansintejan, J., Vandevoorde, J., & Devroey, D. (2013). The gay men sex studies: Erectile dysfunction among Belgian gay men. *International Journal of General Medicine*, 6, 527–534. https://doi.org/10.2147/IJGM.S45783

Wincze, J. P., & Weisberg, R. B. (2015). *Sexual dysfunction. A guide for assessment and treatment* (3rd ed.). The Guilford Press.