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Prevalence of Sexual Dysfunctions in Transgender Persons: Results from the ENIGI Follow-Up Study

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ABSTRACT

Introduction: Studies about sexual functioning in trans persons have mainly focused on sexual functioning after genital gender-affirming surgery, have had small sample sizes, and have not explored the broad range of possible sexual dysfunctions. Measuring sexual functioning in trans persons during transitioning is important to determine the kind of care trans persons may need in order to regain their sexual health.

Aim: The first aim of the present study was to explore the prevalence of sexual function disturbances and dysfunctions (with distress) in trans women and trans men 4 to 6 years after initial clinical entry. The second aim was to compare the prevalence of sexual dysfunctions among the various treatment trajectories and between trans persons with or without further genital treatment intentions.

Methods: An online follow-up questionnaire was filled out by 518 trans persons (307 identifying predominantly feminine, 211 identifying predominantly masculine) as a part of the European Network for the Investigation of Gender Incongruence initiative. All participants had their initial clinical appointments in gender clinics in Ghent, Amsterdam, or Hamburg.

Main Outcome Measure: The main outcome measures were the prevalence of sexual dysfunctions and medical treatment data, measured via self-report items.

Results: The most frequent sexual dysfunctions experienced by trans women and trans men were difficulties initiating and seeking sexual contact (26% and 32%, respectively) and difficulties achieving an orgasm (29% and 15%, respectively). Compared with trans women after hormone treatment and non-genital surgery, trans women after vaginoplasty less often experienced arousal difficulties, sexual aversion, and low sexual desire. Compared with trans men without medical treatment, trans men after a phalloplasty experienced sexual aversion and low sexual desire less often. No significant differences were found between participants with or without further genital treatment intentions.

Clinical implications: Clinicians should consider sexual counseling after medical treatments, paying particular attention to potential social and psychological barriers to the sexual health of their patients.

Strengths & Limitations: This study included all trans persons irrespective of treatment decisions, and focused on a broad range of potential sexual difficulties taking the distress criteria into account. Limitations include the cross-sectional design, the limited power for the comparison of treatment groups and the absence of validated questionnaires about sexual functioning for transgender persons.

Conclusion: Sexual dysfunctions among trans men and women were very common among the various treatment groups and were unrelated to intentions to have further genital treatment. Although medical treatment may be helpful or even essential to developing good sexual health, a significant group of trans persons experienced sexual dysfunctions after genital surgery. **Kerckhof ME, Kreukels BPC, Nieder TO, et al. Prevalence of Sexual**

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INTRODUCTION

Individuals with gender dysphoria (GD) experience distress due to the incongruence between the gender they were assigned at birth and the gender with which they identify.[1] More commonly, the term "transgender" is used. Historically, the sexual experiences of transgender individuals has received little research attention.[2] Recently, however, awareness that sexuality is an important aspect of the lives of most people, including those who are transgender, has grown.[3] Achieving a healthy sexual life can be very challenging for transgender individuals. The distress caused by GD often prevents transgender people from fully developing their sexual health (eg, experiencing pleasurable sexual activities).[3,4] Transgender people are also at a high risk of experiencing sexual violence.[5,6] Furthermore, internalized transphobia might be negatively associated with sexual satisfaction, as has been reported for internalized homonegativity in lesbian and gay adults.[7]

Until now, sexual functioning in trans women has mostly been investigated after both hormone therapy (HT), mainly estrogens, and gender-affirming surgery (GAS), such as breast enlargement and vaginoplasty (except for one study with a nonclinical sample).[8] A systematic review based on 28 studies (N = 1833) found that 63% of trans women reported significant improvement in their sexual functioning following HT and GAS.[9] The majority of trans women have reported being satisfied with their sexual functioning and achieving orgasm regularly.[10–12] Of trans women who were sexually active after HT and GAS, 60% were satisfied with their sexual life and 78% of the total sample could reach orgasm through masturbation, according to one study.[11] A recent follow-up study found an increase in sexual activity, high satisfaction with orgasm, high satisfaction with intercourse, and low pain scores after GAS.[13] However, a decrease in sexual desire has been reported in the majority of transgender women after HT and GAS.[14] Compared to cisgender women, the prevalence of hypoactive sexual desire disorder (HSDD) in trans women has been found to be similar.[15]

The lack of research on experiences with sexuality in trans men is even more pronounced.[16,17] Similar to that of trans women, most research has been limited to the experience of trans men undergoing HT and GAS.[9,18] Overall, an improvement in sexual functioning has been reported after medical treatment.[9,17] HT and GAS led to an increase in sexual desire, sexual arousal, and frequency of sexual activity and masturbation.[9,18,19] Almost all trans men achieved orgasm after HT and GAS.[14] Testosterone administration alone led to a small increase in masturbation frequency, sexual desire, and sexual arousal.[20] After genital GAS, trans men were more sexually active, both with themselves and with a partner.[16]

Most studies have evaluated sexual functioning as part of an evaluation of HT and GAS, so the focus of these studies is primarily on the positive sexual effects of medical treatment; however, there is great variability in sexual functioning after GAS.[18] Despite the reported positive outcomes, trans women after HT and GAS experience specific sexual difficulties related to arousal, lubrication, and pain.[21] Furthermore, poor sexual functioning (eg, not being able to achieve orgasm) before GAS could predict poor sexual functioning after GAS.[22]

The findings thus far suggest the potential for transgender persons to encounter sexual difficulties, but these have not yet been explored in detail in a large sample of both trans women and trans men. Studies that have considered sexual functioning have focused primarily on orgasm capacity rather than the broad range of other possible sexual difficulties.[11,12,18,22,23] Furthermore, studies have not differentiated between sexual function disturbances and sexual dysfunctions (problems associated with distress). It has been shown in population-based studies that the prevalence of function disturbances is higher than that of sexual dysfunctions.[24,25] Because not all sexual problems are associated with the experience of distress, prevalence rates can be overestimated.[26]

Consequently, the present study first aimed to assess the prevalence rates of sexual function disturbances and sexual dysfunctions (with distress) in a large cohort of individuals previously diagnosed with GD, 4 to 6 years after their initial contact with specialist care, irrespective of the treatment trajectory. Second, potential differences in the prevalence of sexual dysfunctions among the various treatment trajectories were explored (eg, no medical treatment vs HT vs HT and GAS combined). Finally, the prevalence rates of sexual dysfunctions were compared between participants with and without further treatment intentions for genital surgery.

METHODS

Procedure

In 2007, 4 European gender clinics (Amsterdam, Ghent, Hamburg, and Oslo) established a standardized protocol for the assessment of all individuals who attended the gender clinics. All individuals 17 years of age or above were invited to fill out a standardized battery of self-administered questionnaires. Individuals with acute psychotic disorders or who did not master the local language were excluded. For a complete description of the procedures of the European Network for the Investigation of Gender Incongruence, see the first published study.[27]

3 clinics (Amsterdam, Ghent, and Hamburg) participated in the current follow-up study. For the first round (follow-up 1, or FU1), all individuals who completed the diagnostic protocol in 2007, 2008, or 2009 were contacted between July and September 2013 (see the method in the FU1 paper[28]). The 2010 cohort was excluded in order to obtain similar follow-up periods. For the second round, all individuals who had their first clinical contact in 2011, 2012, or 2013 were contacted between September 2017 and April 2018 (follow-up 2, or FU2). The clinicians (or hospital staff, as was the case in Amsterdam) invited the participants by phone, e-mail, or regular mail to fill out an online follow-up questionnaire. Participants who did not respond after 1 month were sent a reminder. This study was approved by the local ethics committees. All participants gave their online or written informed consent.

Participants

A total of 1089 individuals were invited for the follow-up study regardless of whether or not they had received any medical treatment. For FU1 and FU2 combined, 550 people (50.51%) both consented and (partially to completely) filled out the survey (Amsterdam, n = 295; Ghent, n = 157; Hamburg, n = 98). Of these 550 participants, 2 participants were excluded (see Appendix A), and 518 provided the data about sexual functioning necessary for the current data analysis. Of these, 307 were assigned male at birth (59.3%), and 211 were assigned female at birth (40.7%). In the present study, participants are referred to as trans women (assigned male at birth) and trans men (assigned female at birth), although it should be emphasized that this may not entirely capture the diverse ways people experienced and described their gender identity in both groups (see Table 1).

Outcome Measures

Background Data

Biographical data (eg, age, educational level, marital status) were assessed by self-developed questions included in the baseline questionnaire (see Kreukels et al[27]).

Medical Treatment Data

First, participants were asked if they had received medical treatment for their GD (no medical treatment, own choice; no medical treatment, other reason; yes, I already received medical treatment before I entered the clinic; yes, I have received medical treatment since I entered the clinic). For participants who answered "yes," subsequent questions explored whether or not they received hormonal treatment and which operations they had undergone (eg, mastectomy, facial surgery, vocal cord surgery, vaginoplasty). All participants were asked if they intended to seek further medical treatment. Participants who answered "yes" were then asked to indicate which treatment they might seek from among a list of possible operations. Participants who indicated an interest in undergoing phalloplasty, metoidioplasty, or vaginoplasty were coded as intending genital surgery in the future. Due to inconsistencies and

Table 1. Sample characteristics

Characteristic	Trans women (N = 307)	Trans men (N = 211)
Age, mean (SD)	43 (14)	33 (11)
Employed,* n (%)	187 (64.9)	155 (79.5)
Gender identity, n (%)	n = 303	n = 208
Male	6 (2.0)	131 (63.0)
Female	208 (68.6)	2 (1.0)
Trans women	61 (20.1)	0
Trans men	0	47 (22.6)
In between	21 (6.9)	24 (11.5)
Other (eg, gender fluid)	7 (2.3)	4 (1.9)
Education,† n (%)	n = 307	n = 210
Low	29 (9.4)	16 (7.6)
Intermediate	139 (45.3)	113 (53.8)
High	139 (45.3)	81 (38.6)
Current partner, n (%)	n = 307	n = 209
Male partner‡	48 (15.6)	23 (11.0)
Female partner‡	91 (29.6)	72 (34.4)
Other (eg, transgender, asexual)	24 (7.8)	7 (3.3)
Not applicable	144 (46.9)	107 (51.2)
Treatment groups, n (%)	n = 307	n = 207
NT group	29 (9.4)	8 (3.9)
HT group	71 (23.1)	—
VA group	207 (67.4)	—
MA group	—	132 (63.8)
ME group	—	12 (5.8)
PH group	—	44 (21.3)
Only HT or only mastectomy	—	11 (5.3)
Time span from treatment to survey, n (%)		
Vaginoplasty/phalloplasty		
<1 y	17 (9.5)	8 (20.5)
1–2 y	41 (22.9)	6 (15.4)
2–3 y	77 (43.0)	14 (35.9)
>3 y	44 (24.7)	11 (28.2)
Metoidioplasty		
<1 y	—	2 (33.3)
1–2 y	—	3 (50.0)
2–3 y	—	1 (16.7)
Hormone treatment		
<1 y	7 (2.9)	3 (1.9)
1–2 y	7 (2.9)	4 (2.5)
2–3 y	16 (6.6)	8 (5.1)
>3 y	211 (87.4)	142 (90.4)

HT group = hormone treatment group (and non-genital surgery); MA group = hormone treatment, mastectomy, and optional ovariohysterectomy; ME group = hormone treatment, ovariohysterectomy, mastectomy, and metoidioplasty; NT group = no medical treatment group; PH group = hormone treatment, ovariohysterectomy, mastectomy, and phalloplasty; VA group = hormone treatment and vaginoplasty.

*Full-time and part-time employment and education.

†Low includes lower education and lower vocational school; middle includes secondary education and secondary vocational or high school; high includes higher vocational school or bachelor, master, or doctorate degree.

‡Heterosexual, homosexual, or bisexual partners.

missing information in the self-report data regarding medical treatment, information on medical procedures was also retrieved from their clinical records. All inconsistencies were resolved by checking the clinical records.

Treatment Groups

Trans men were divided into the following treatment groups: (i) no medical treatment (NT group); (ii) hormone treatment, mastectomy, and optional ovariohysterectomy (MA group); (iii) hormone treatment, ovariohysterectomy, mastectomy, and metoidioplasty (ME group); or (iv) hormone treatment, ovariohysterectomy, mastectomy, and phalloplasty (PH group). 2 small treatment groups were left out of the exploratory analysis: 9 individuals who only received hormone treatment and 2 individuals who only had a mastectomy. Trans women were divided into the following treatment groups: (i) no medical treatment (NT group); (ii) hormone treatment and optionally other non-genital surgery (eg, breast augmentation) (HT group); or (iii) hormone treatment, vaginoplasty, and other surgery (VA group). All trans women could be categorized in these 3 groups.

Sexual Dysfunctions

A list of possible sexual difficulties was constructed based on the variety of sexual problems assessed by Schönbucher and colleagues[29] to investigate sexual functioning in individuals with disorders of sex development. Their list included the sexual dysfunctions defined in the DSM-IV-TR:[30] low sexual desire, sexual aversion, arousal difficulties, orgasm difficulties, unwanted ejaculation, pain after intercourse, and vaginal cramp. Two dysfunctions were added based on clinical experience: absent ejaculation and pain during sexual intercourse. Participants were asked to score the list of sexual difficulties only if they were sexually active. Participants were shown the list of sexual difficulties (eg, vaginal cramp, aversion to sex) and asked to indicate if they had experienced any of the listed difficulties (yes, no, or not applicable). Individuals who answered positively to the presence of a sexual problem were consequently asked whether they experienced distress due to this problem (yes or no). It was also possible for participants to describe other sexual problems that were not yet accounted for (see Appendix B).

A new variable was created that indicated whether the individual had a sexual dysfunction (problem with distress) or a sexual function disturbance without distress, or did not experience a particular difficulty. Participants could also indicate that a question was not applicable to them. Those responses were not further involved in the statistical analyses, resulting in the exclusion of participants who were not sexually active (with themselves or another person; similar to Hendrickx et al[25]). In total, 60 trans women (19.5%) and 19 trans men (9.1%) answered "not applicable" to all questions on sexual difficulties. Those participants were less often in a relationship and attached less importance to sexuality. The excluded participants did not differ significantly from the sexually active participants with regard to which medical treatment (if any) they had undergone.

Statistical Analyses

All statistical analyses were performed separately for trans women and trans men. The prevalence of sexual function disturbances (without distress) or sexual dysfunctions was calculated, and the percentages are reported for each sexual difficulty. The prevalence of sexual dysfunctions was also reported by treatment trajectory. Non-parametric tests were used to test for significant differences among treatment trajectories (nominal data). Fisher's exact test was used when the assumptions for using the χ^2 test were not met. For the exploratory analysis of the effect of treatment group, a significance level of .10 was used. To test the difference between the treatment groups that were most represented, a significance level of .05 was used. Fisher's exact test with a significance level of .05 was used to explore potential confounding effects of country. When there were sufficient observations per degree of freedom,[31] binary logistic regression was used to control for age and country. The relative risk (RR) that compared the chance of experiencing a sexual dysfunction in one group compared to another group was calculated. All analyses were performed in SPSS Statistics 24 (IBM; Armonk, NY).

Description of the Sample

Characteristics of our sample are presented in Table 1. The mean age of trans women was 43 years (SD = 14), and for trans men it was 33 years (SD = 11). Of the group labeled "trans women," the majority identified as either female (68.6%) or trans woman (20.1%). Of the group labeled "trans men," 63.0% identified as male and 22.6% as trans man. Forty-five participants identified themselves as "in between." Eight participants identified themselves as the sex assigned at birth (Appendix A).

In comparison with the eligible but non-participating individuals, the study participants were significantly older (32.95 years [SD = 13.15] vs 29.42 years [SD = 11.16]; $t(1058) = -4.835$; $P < .001$) and more educated (38.6% vs 24.6% received higher education; $\chi^2(2) = 29.691$; $P < .001$). Participants reported they were more satisfied with their sex life (37.1% vs 29.6%; $\chi^2(1) = 6.610$; $P < .05$) and had experienced sexual abuse less often (8.2% vs 13.2%; $\chi^2(2) = 8.062$; $P < .05$) compared with individuals who did not participate. At baseline, the groups did not differ significantly with regard to the importance attached to sex, partnership status, medical treatment at baseline, percentage that masturbated, or percentage that was seeing a psychologist/psychiatrist.

Current Partner

53% of trans women were in a relationship; 56.2% had a female partner (57.6% of those partners identified as homosexual or bisexual), and 29.3% were in a relationship with a male partner (68.8% of those partners identified as heterosexual). 49% of trans men were in a relationship; 69.9% had a female partner (69.4% of the partners identified as heterosexual), and 22.3% had a male partner (91.3% of those partners identified as homosexual or bisexual). A smaller group (7.8% of trans women, 3.3% of trans men) had a partner they defined as "other," most

often described by the participants as a transgender, pansexual, or asexual partner.

Medical Intervention

Almost all participants were receiving hormone therapy at follow-up (90.9% of trans women and 94.3% of trans men). 80% of the participants had received hormone treatment for 3 to 5 years. The majority of the participants from Ghent and Amsterdam who received hormonal treatment were also included in the European Network for the Investigation of Gender Incongruence endocrinology study. The protocol and extensive information about the hormonal treatment can be found in the paper by Dekker and colleagues.[32] Of the trans women who had hormonal therapy but did not undergo vaginoplasty (HT group), 19.2% also had breast augmentation surgery. The majority of trans women had undergone a vaginoplasty (VA group) at follow-up (67.2%), and 55.4% of this group underwent breast augmentation surgery. For a quarter of the trans women, the vaginoplasty was more than 3 years before the time of the study. About 10% of trans women had the vaginoplasty within the previous year before participating in the current study. Most trans men had minimal HT and mastectomy (90.8%). In the MA group, the majority of trans men (84.3%) also had an ovariohysterectomy. 21% of trans men had phalloplasty surgery, and 31.8% of that group also had an erection prosthesis placed. Most trans men had the phalloplasty operation between 1 and 4 years before the time of research, 20% within 1 year before the survey. Only a small number of trans men underwent a metoidioplasty (5.8%). All trans men who underwent genital surgery also had their uterus and ovaries removed.

Differences in Medical Treatment Across Countries

Table 2 shows the treatment groups by country. There was a significant difference in treatment trajectories across the 3 countries for both trans women ($P < .001$) and trans men ($P < .01$). In Hamburg, trans women less often had received vaginoplasty at follow-up compared to trans women in Ghent ($P < .001$) and Amsterdam ($P < .001$). Trans men more often underwent phalloplasty in Ghent compared to in Hamburg ($P < .001$) or Amsterdam ($P < .001$).

RESULTS

Prevalence of Sexual Difficulties

Of the sexually active trans women who responded (yes/no) to minimal 1 sexual problem (N=246), 69% reported at least 1 sexual dysfunction Figure 1 shows the most frequent sexual dysfunctions: difficulty in achieving an orgasm (29%), difficulty in initiating sexual contact (26%), and pain during sexual intercourse (24%). The prevalence of sexual dysfunctions (ranging from 6−29%) was higher than the prevalence of function disturbances without distress (1−25%), except for low sexual desire (25% did not report distress).

Of the sexually active trans men who responded (yes/no) to a minimal of 1 sexual problem (N=189), 54% reported at least 1 sexual dysfunction. Figure 2 shows the most frequent sexual dysfunctions for trans men: difficulty in initiating and seeking sexual contact (32%), fear of sexual contact (22%), and difficulty achieving orgasm (15%). Fear of injury (16%) was only calculated for trans men who had genital surgery (ME and PH groups). For all sexual problems (except for low sexual desire), sexual problems were more often than not associated with distress.

Prevalence of Sexual Dysfunctions by Treatment Group

Trans Women

The prevalence of sexual dysfunction across different treatment groups of trans women is displayed in Figure 3. The exploratory analysis with Fisher's exact test first indicated

Table 2. Sample characteristics across countries

	Ghent		Hamburg		Amsterdam	
Characteristic	Trans women	Trans men	Trans women	Trans men	Trans women	Trans men
N	94	54	42	54	171	103
Sex ratio	1.7:1	—	1:1.3	—	1.7:1	—
Age (y), mean (SD)	39.7 (12)	31.7 (10)	41.3 (12)	32.4 (10)	44.5 (15)	33.9 (11)
Response rate (%)	65.1		63.5		43.2	
Treatment (%)						
NT group	6.4	2.0	11.9	8.2	10.5	4.1
HT group	20.2	—	47.6	—	18.7	—
VA group	73.4	—	40.5	—	70.8	—
MA group	—	35.3	—	79.6	—	77.3
ME group	—	9.8	—	2.0	—	6.2
PH group	—	52.9	—	10.2	—	12.4

HT group = hormone treatment group (and non-genital surgery); MA group = hormone treatment, mastectomy, and optional ovariohysterectomy; ME group = hormone treatment, ovariohysterectomy, mastectomy, and metoidioplasty; NT group = no medical treatment group; PH group = hormone treatment, ovariohysterectomy, mastectomy, and phalloplasty; VA group = hormone treatment and vaginoplasty.

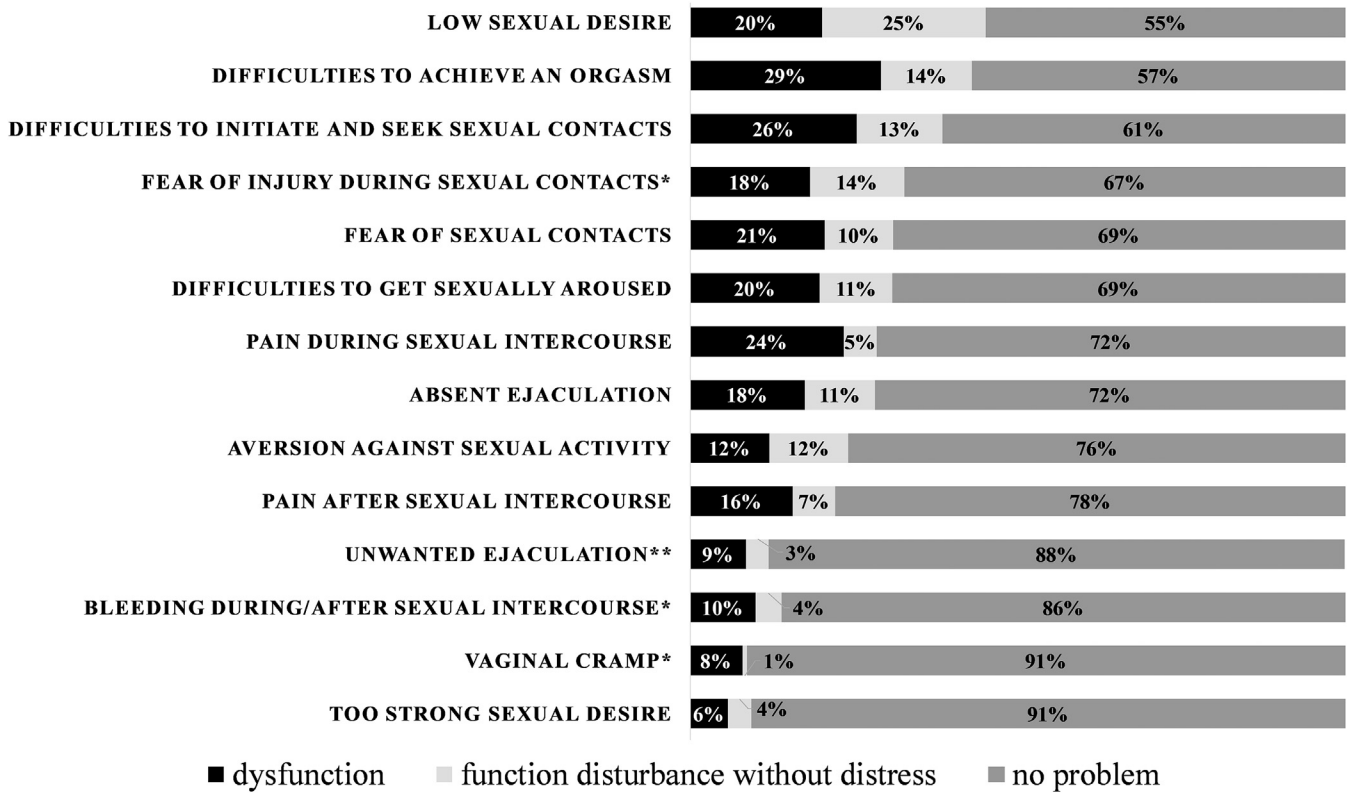

Figure 1. The prevalence of sexual dysfunctions and function disturbances for trans women. * trans women who had vaginoplasty, ** trans women who did not have vaginoplasty.

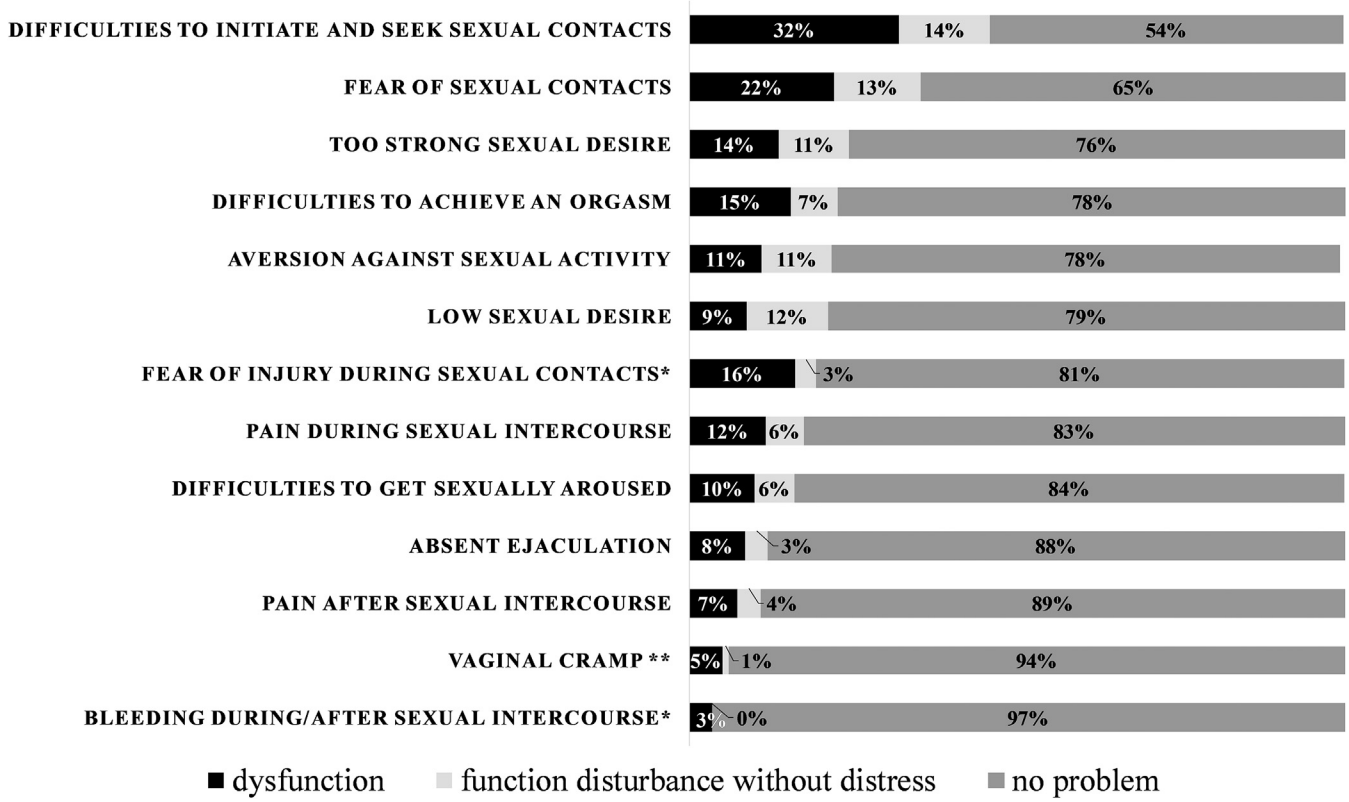

Figure 2. The prevalence of sexual dysfunctions and function disturbances in trans men. * trans men who had genital surgery, ** trans men who did not have genital surgery.

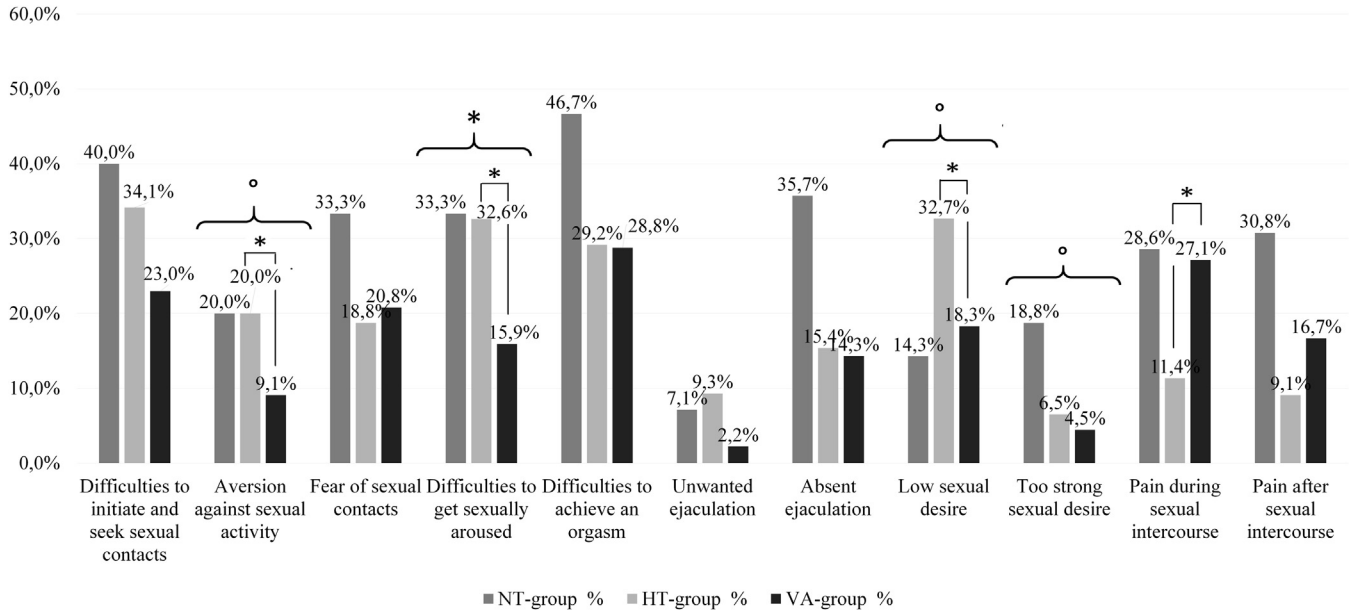

Figure 3. The prevalence of sexual dysfunctions among treatment groups for trans women. Treatment groups: NT-group (mean valid N=14): no medical treatment; HT-group (mean valid N=45): HT (and non-genital surgery); VA-group (mean valid N=129): HT and vaginoplasty. Significant results displayed from Fisher Exact test for exploratory analysis between all treatment groups, Chi-Square test for the comparison between the HT-group and VA-group, significance levels: ° $p<0.10$, *$p<.05$.

significant group differences in arousal difficulties (n = 217; $P = .031$), sexual aversion (n = 202; $P = .072$), low sexual desire (n = 215; $P = .073$), and too strong sexual desire (n = 218; $P = .082$), as well as marginal significance for pain during sexual intercourse (n = 197; $P = .102$). Second, prevalences were compared between the HT group and VA group using the χ^2 test. The RR was calculated for a sexual dysfunction in the VA group compared to the HT group. The VA group reported significantly lower prevalence of arousal difficulties ($\chi^2[1] = 5.178$; $P = .023$; RR = 0.51), sexual aversion (χ^2 [1] =4.186; $P = .041$; RR = .44), and low sexual desire (χ^2 [1] = 4.829; $P = .028$; RR = .55). The chance of having those dysfunctions in the VA group was lowered by approximately 50%. The VA group experienced significantly more pain during sexual intercourse compared to the HT group (χ^2 [1] = 4.405; $P = .036$; RR = 2.34). The relative risk for the experience of pain during sexual intercourse in the VA group was 2.3 times that of the HT group. After controlling for country and age using a binary logistic regression model, variable treatment (VA group vs HT group) continued to be a significant predictor for difficulties in sexual arousal, low sexual desire, and pain during sexual intercourse. In addition, using Fisher exact test, no indication was found that the prevalence of sexual dysfunctions differed significantly across countries (all $P > .05$).

Trans Men

The percentages of sexual dysfunctions by treatment group are presented in Figure 4. Fisher exact test indicated a significant group effect on the prevalence rate for low sexual desire (n = 170; $P = .021$) and sexual aversion (n = 156; $P = .085$). Also, the prevalence of dysfunctions in the MA group was compared to the prevalence in the PH group. The number of valid responders in the NT group (n < 9) and ME group (n < 12) was considered too small for further comparisons. The probability of experiencing pain after sexual intercourse was almost 4 times higher in the PH group than in the MA group (n = 115; $P = .037$; RR = 3.89). An additional analysis of the PH group comparing the prevalence of sexual dysfunctions between those with an erection prosthesis (n = 14) and those without one (n = 30) showed no significant differences. A significant difference between countries was observed only for difficulties in initiating and seeking sexual contact (Ghent, 18%; Hamburg, 43%; Amsterdam, 38%) (n = 141; $P = .046$). This difference was no longer significant after excluding trans men who had phalloplasty (the PH group was larger in Ghent).

Prevalence of Sexual Dysfunctions by Further Treatment Intentions

Participants who had not yet received genital surgery (vaginoplasty, metoidioplasty, or phalloplasty) and had the intention to undergo genital surgery in the future were categorized in the group with the intention of undergoing further treatment (FT group; n = 32 trans women and n = 48 trans men). Participants who had not yet received genital surgery but were unsure or had no intention of undergoing future treatment for genital surgery were categorized in the group with no future treatment intentions (NFT group; n = 64 trans women and n = 93 trans men). The RR was calculated for a sexual dysfunction in the FT group compared to the NFT group.

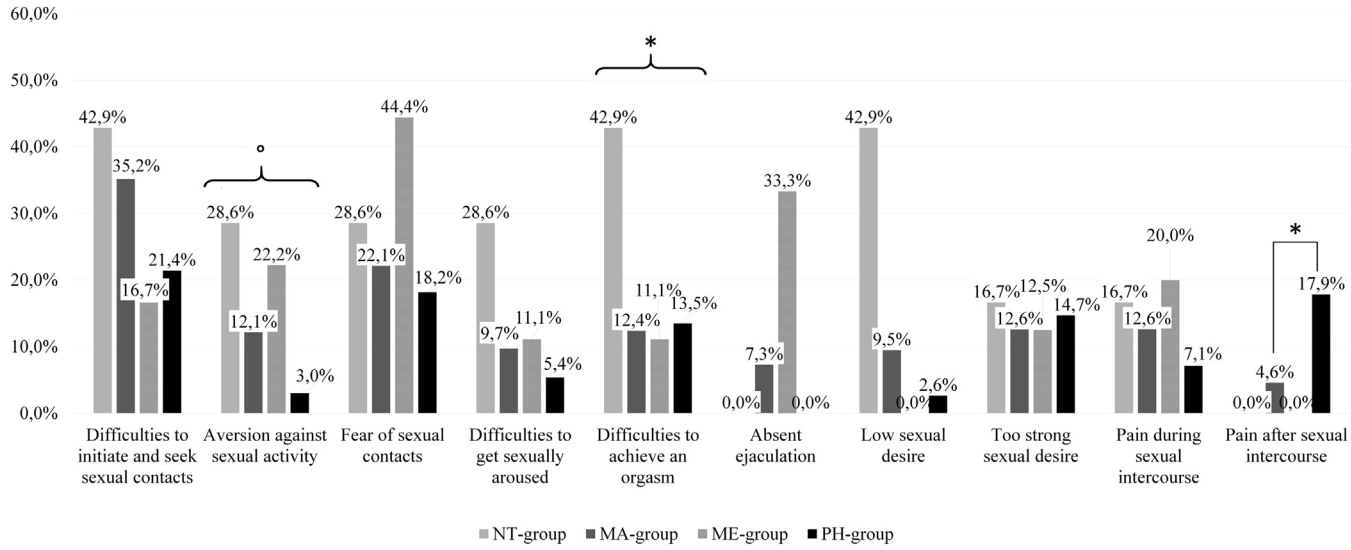

Figure 4. The prevalence of sexual dysfunctions among treatment groups for trans men. Treatment groups: NT-group (mean valid N= 6): no medical treatment; MA-group (mean valid N= 97): HT and mastectomy (and ovariohysterectomy); ME-group (mean valid N=8): HT, ovariohysterectomy, mastectomy and metoidioplasty; PH-group (mean valid N=30): HT, ovariohysterectomy, mastectomy and Phalloplasty. Significant results displayed from Fisher Exact test for exploratory analysis between all treatment groups, Chi-Square test for the comparison between the MA-group and PH-group, significance levels: ° $p<0.10$, * $p<.05$.

Trans women

More trans women in the FT group reported distress related to fear of sexual contact (38.9%) compared with trans women in the NFT group (14.0%) (n = 61; $P = .043$; RR = 2.78). The opposite was found for sexual aversion, although it was only marginally significant; 26.8% of the trans women in the NFT group reported aversion compared with 5.9% of women in the FT group (n = 58; $P = .088$; RR = 0.22). For the other sexual dysfunctions, no significant differences were observed.

Trans men

For the dysfunction of not being able to ejaculate, a marginally significant difference was found between both groups. More trans men in the FT group (25.0%) experienced not being able to ejaculate as distressing (n = 42; $P = .088$). Only 1 of the 34 trans men who did not intend to have genital surgery reported the lack of ejaculation to be stressful. For all other dysfunctions, no significant differences were found.

Qualitative Comments of Sexually Inactive Participants

Participants were offered the opportunity to write comments next to the questions about sexual difficulties, and those comments gave us more insight into the diverse reasons why some trans persons answered "not applicable" to some questions. Importantly, some of the trans persons reported that they felt inhibited in sexual relationships or could not enjoy sex because of their body dysphoria. Having a body that does not yet conform to the cisnorm or binary norm can discourage trans persons from having sexual relationships. For example, some trans men reported that not having a penis or not being capable of having an erection made it difficult for them to have sexual relationships. Also, a few participants reported that surgical complications had caused severe sexual difficulties that made it impossible for them to have a sexual life (eg, loss of all genital sensation). Some participants commented that they were comfortable with not having a sexual life (eg, identifying as asexual, having no interest in sex)

DISCUSSION

This study explored the prevalence of sexual dysfunctions and function disturbances among 518 trans persons 4 to 6 years after their first clinical contact with a gender clinic in Amsterdam, Ghent, or Hamburg. The most frequent sexual dysfunctions in both trans men and trans women were difficulty with initiating and seeking sexual contact and difficulty achieving orgasm. Furthermore, trans women often reported too low sexual desire, and trans men frequently reported too strong sexual desire. Prevalence rates of sexual dysfunctions were higher in groups with fewer medical interventions, but, surprisingly, they were rarely related to further genital treatment intention.

In sexology research, an important distinction has been made between a sexual function disturbance with distress (sexual dysfunction) or without distress.[26] For example, sexual difficulties with desire, arousal, or orgasm do not always cause distress in women.[24] In our sample, the prevalence of functional disturbances without distress was rather low, suggesting that most sexual difficulties are considered distressing for trans persons. The exception was low sexual desire, which, as reported previously,[14] did not cause distress for the majority of trans women. Sexual difficulties might be experienced differently by trans people and have other determinants (eg, body dysphoria). An

example would be trans persons expecting positive effects on sexual functioning from medical treatment, but when they still experience sexual difficulties after treatment such problems could be experienced as more distressing.

Almost one-third of trans women experienced distress because of orgasm difficulties. Although it has been reported that 18% of trans women never achieved orgasm after GAS,[12] that number is still considerably smaller than the percentage of orgasm dysfunctions reported by our sample. The high prevalence of orgasm difficulties alters the overall positive picture of orgasmic functioning after medical treatment.[12,33] After vaginoplasty, trans women still scored high on orgasm difficulties, with no significant difference between the groups with or without genital surgery. This suggests that genital GAS might not be sufficient to decrease orgasmic problems. The few studies about the effect of GAS on increasing or decreasing orgasmic functioning have found inconsistent results.[18] One-fifth of trans women experienced arousal difficulties and more than one-quarter of trans women reported distress related to pain during or after sexual intercourse. Pain related with the neovagina has been reported previously,[21] although in our sample pain was also reported by trans women who had not received any medical treatment. To our knowledge, no studies have explored which sexual activities are most often related with pain.[21] It could be hypothesized that trans women without medical treatment are more frequently having anal penetrative sex, resulting in pain during intercourse.

It is important to note that difficulties with initiating sexual contact and the fear of sexual contact were the 2 most common dysfunctions in trans men, and they were very prevalent in trans women as well, both before and after genital GAS. For trans persons, it can be difficult to find partners who respect their gender identity.[33] Furthermore, a recent study showed that the willingness to date transgender persons was very low.[34] The distress related with those particular dysfunctions (not measured in earlier studies) indicates that trans persons face specific challenges in achieving sexual health (socially and psychologically) that are not completely resolved after GAS. Those difficulties have to be understood not only on the individual level but also on the societal level. Interestingly, although an increase in sexual desire is considered a desirable side-effect of testosterone treatment,[35] a considerable number of trans men in all treatment groups reported distress because of too strong sexual desire, but this problem has been estimated to affect only 2−6% of trans men.[33] Reports of this distress conflict with reports that an increased sex drive returns to baseline after hormone treatment in most trans men.[20]

The nature of dysfunctions most commonly experienced by trans women—namely, difficulty with desire, arousal, orgasm, and pain—was found to be similar to that of the general female population.[24,25,36] The comparison for trans men was less evident, as they cannot experience the autonomous erectile response that cis men can. The prevalence of most sexual dysfunctions was higher in the trans women and men compared to the general female and male population.[24,25,36] For example, 32.4% of Belgian trans women experienced orgasm difficulties compared to 7.4% in the general female Belgian population.[25] However, we should be careful with this comparison, as different studies have used different criteria to define sexual dysfunction.

Trans women who had HT and genital surgery generally reported the lowest number of sexual dysfunctions, and trans women without any medical treatment reported the highest prevalence of sexual dysfunctions. This corresponds to other studies that showed beneficial effects of HT and GAS on sexual functioning.[9,12] Trans women who had undergone vaginoplasty reported significantly less distress caused by arousal difficulties, sexual aversion, and low sexual desire compared to trans women on hormones only. Trans women who have not received medical treatment might still be dissatisfied with their bodies, but they may be abstaining from treatment for a variety of reasons (eg, fear) (as described by Nikkelen and Kreukels[8]).

In trans men, the trend toward fewer sexual dysfunctions in the groups who received more treatment was similar, except for the small group of trans men who had a metoidioplasty, who often reported more sexual dysfunctions than the trans men who had HT and mastectomy. The lower prevalence of dysfunctions in the trans men who received treatment may be explained by the physical changes brought by testosterone treatment and GAS.[37] It has been suggested that chest surgery may be a crucial factor for the sexual self-esteem of trans men.[8] Unlike for trans women, almost no significant differences were found between the groups with or without phalloplasty, possibly due to low power. Nonetheless, other studies have found that trans men more easily reached orgasm following phalloplasty and more often considered their orgasm to be pleasant.[11,23]

Despite this tendency, several sexual dysfunctions (eg, orgasm difficulties, fear of sexual contacts) were also common in the group who received HT and genital surgery. A possible explanation for the presence of dysfunctions in that group is that several transgender persons still experience body dysphoria or sexuality-related body image problems even after medical treatment.[38] Those problems might exist because surgery is limited in possibilities (eg, no spontaneous erection possible for trans men) and has high risks for complications.[17] In addition, transgender health care often ends after medical treatment, but some participants might be just beginning to explore their sexuality after their medical treatment. Sex counseling and/or sex therapy after HT and GAS might help transgender persons to improve their sexual health.[33]

Surprisingly, we could not fully confirm that trans persons without further genital treatment intentions experienced fewer sexual dysfunctions than those intending to receive further treatment. Trans women with the intention to undergo vaginoplasty in the future more often reported fear of sexual contact. This result might be biased, as the FT group contained more trans people identifying within the gender binary, and the NFT

group included more trans women identifying as "in between." Similarly, we observed that trans men who still planned to have genital surgery more often experienced the absence of ejaculation as distressing. Those trans men might consider phallocentric sexual functioning (including the possibility of erection and ejaculation) more important than do trans men not intending genital surgery.

Furthermore, future research should take into account the diversity of motivations for not intending to have genital surgery. To illustrate, 24% of trans men who did not intend to have further treatment commented that they were waiting for better techniques for genital surgery, they did not want to risk the complications, or they did not have confidence in the results obtained to date (eg, functionality of the penis). Although they were classified as not intending to have further treatment, their comments suggest that they did have a latent treatment wish and could have formed a separate group. Future research should further distinguish between persons having a more intrinsic motivation for not pursuing genital surgery (eg, not feeling the need at that moment) and persons with an extrinsic motivation (eg, fear of complications, not having the financial means). Trans persons with an intrinsic motivation for not choosing to have genital surgery might differ significantly in sexual functioning, ideas about sexuality, and relationships from other trans persons.

Although the prevalence rates of sexual dysfunctions were rather high (compared to general population studies), some transgender persons did not experience any of the surveyed sexual dysfunctions. The paradigm shift in general sexology toward studying more positive and pleasurable dimensions of sexual functioning has not yet reached transgender research. Future research exploring coping strategies and sexual experiences of transgender people who do not experience dysfunction could provide valuable information for clinicians and transgender persons.

Our study explored the prevalence of a broad range of sexual dysfunctions measured at one fixed moment during the individual's transition process. Prospective research is essential to investigate the associations among undergoing medical treatment, satisfaction with the various kinds of surgical techniques, finding a supportive partner, experiencing complications after surgery, and sexual functioning measures. Furthermore, the high prevalence of several dysfunctions in trans men after metoidioplasty (eg, 50% reported fear of sexual contact) suggests that more research into sexual functioning after metoidioplasty is important. Qualitative research should further investigate the specific challenges transgender persons experience in achieving sexual health. Qualitative research could provide more insights into why transgender people experience difficulties with, for example, initiating and seeking sexual contact, and which factors could help transgender people cope with those difficulties and experience positive sexuality. Furthermore, future research should include sexually non-active persons in the sample, as the absence of sexuality in itself might be considered distressing (or problematic) for some trans persons.

Strengths and Limitations

Taking the distress criteria into account, this study explored the prevalence of numerous sexual difficulties in a large cohort of people who had gender dysphoria 4 to 6 years after their initial clinical contact in a gender clinic. Unlike other studies on sexual functioning,[11,12,22,23] our study included all trans persons irrespective of treatment decisions and focused on a broad range of potential sexual difficulties. However, there were several limitations. First, due to the cross-sectional design (questionnaires upon first clinical contact did not contain questions concerning sexual dysfunctions), claims regarding whether or not medical treatment is effective in reducing the prevalence of sexual dysfunctions cannot be made. The group that had medical treatment possibly experienced fewer sexual dysfunctions before beginning medical treatment. Second, the comparison between treatment groups was limited in power as most participants followed a similar treatment trajectory (eg, almost all had hormonal treatment). Third, the study could not use a validated questionnaire because surveys about sexual dysfunctions have not yet been validated for transgender persons. Participants could have interpreted the sexual difficulties in different ways or might not have understood some of the difficulties (eg, aversion, vaginal cramp). As this study was part of a broader follow-up study, more specific research is necessary together with the development of validated questionnaires about sexual (dys)functioning in transgender individuals. Finally, a non-responder analysis showed that the participating group was more educated, older, and more often satisfied with their sex life than were the non-responders. Hence, current prevalence rates might still be an underestimation.

CONCLUSION

Our data contribute to developing a more nuanced picture of sexual difficulties in trans persons 4 to 6 years after clinical entry in specialized care. Many trans persons report sexual dysfunctions. Particularly common are difficulties with initiating sexual relationships and fear of sexual contact. Even though medical treatment may be an important factor in developing (or even enabling) both sexually active and satisfying relationships for transgender people, it is not always a guarantee for obtaining sexual health.

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SUPPLEMENTARY DATA

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jsxm.2019.09.003.