Childhood gender non-conformity, sexual orientation and mental health problems among 18 to 89 year-old Danes

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Background in brief

- Childhood gender non-conformity may be a risk factor for mental health problems, but prior research on this topic has focused primarily on non-probability-based samples of young individuals and sexual or gender identity minorities.
- This study assessed the prevalence of recalled childhood gender non-conformity in Denmark and investigated links between such non-conformity and mental health problems in a nationally representative sample of 27,548 individuals aged 18-89 years.

Main findings

Characteristics of childhood-gender conforming and non-conforming individuals

Table 1: Sociodemographic variables, partner status, gender identity and sexual characteristics among 22,193 childhood gender conforming and 5,355 childhood gender non-conforming individuals aged 18 to 89 years, Denmark 2017-2018	Women				Men		
	Gender conforming in childhood	*Gender non-conforming in childhood*	*p^a*		*Gender conforming in childhood*	*Gender non-conforming in childhood*	*p^a*
	N (%)	N (%)			N (%)	N (%)	
Total	11439 (100)	3056 (100)			10754 (100)	2299 (100)	
Age			<0.001				<0.001
18-24 years	1492 (12.4)	403 (12.1)			897 (12.5)	166 (11.4)	
25-34 years	2004 (14.0)	572 (14.7)			1379 (14.5)	241 (12.5)	
35-44 years	2010 (15.0)	534 (14.1)			1766 (16.1)	264 (11.1)	
45-54 years	2216 (18.3)	547 (16.1)			2080 (19.4)	348 (15.0)	
55-64 years	1944 (16.5)	477 (14.7)			2023 (16.5)	380 (14.7)	
65-74 years	1285 (14.3)	338 (14.3)			1673 (13.7)	486 (19.5)	
≥75 years	488 (9.5)	185 (14.2)			936 (7.2)	414 (15.8)	
Educational attainment			<0.001				<0.001
≤10 years	933 (9.9)	419 (16.9)			1315 (12.8)	533 (24.2)	
Secondary education	1173 (9.8)	331 (9.9)			964 (11.1)	199 (11.1)	
Short-cycle higher education	2295 (20.4)	686 (22.3)			1530 (14.2)	280 (12.2)	
Medium-cycle higher education	5068 (44.4)	1227 (40.4)			4658 (42.2)	895 (37.9)	
Long-cycle higher education	1921 (15.6)	372 (10.5)			2212 (19.6)	351 (14.6)	
Difficulties paying bills within the last year			<0.001				<0.001
Not at all	9611 (85.3)	2299 (77.5)			9451 (86.9)	1917 (81.7)	
Sometimes	1574 (13.1)	601 (18.1)			1136 (11.6)	322 (15.7)	
Often	187 (1.6)	139 (4.4)			139 (1.5)	48 (2.6)	
Partner status			<0.001				<0.001
No spouse/partner	2578 (26.4)	800 (30.6)			1891 (21.1)	503 (26.0)	
Spouse/partner	8806 (73.6)	2240 (69.4)			8816 (78.9)	1780 (74.0)	
Gender identity			<0.001				<0.001
Cisgender	11384 (99.7)	2977 (98.2)			10719 (99.7)	2270 (98.6)	
Non-cisgender	39 (0.3)	74 (1.8)			24 (0.3)	24 (1.4)	
Sexual identity			<0.001				<0.001
Heterosexual	10613 (93.1)	2442 (83.1)			10131 (95.4)	1856 (84.7)	
Homosexual	124 (0.4)	174 (1.9)			219 (0.9)	214 (4.9)	
Bisexual	237 (1.7)	187 (5.0)			176 (1.7)	53 (2.6)	
Asexual	28 (0.2)	20 (0.6)			11 (0.1)	3 (0.2)	

Cannot be placed in the abovementioned categories	265 (2.8)	126 (5.3)			123 (1.1)	89 (3.7)	
Do not know/undecided	172 (1.8)	107 (4.1)			94 (0.8)	84 (3.9)	
Same-sex sexual behavior			<0.001				<0.001
None	10389 (92.8)	2436 (86.5)			10011 (94.4)	1964 (89.9)	
Any	970 (7.2)	575 (13.5)			718 (5.6)	317 (10.1)	
Same-sex sexual attraction			<0.001				<0.001
None	8015 (73.9)	1740 (64.5)			9307 (88.0)	1737 (80.4)	
Any	3295 (26.1)	1240 (35.5)			1328 (12.0)	500 (19.6)	
Victim of sexual assault before age 18 years			<0.001				<0.001
No	10585 (93.9)	2607 (88.3)			10633 (99.0)	2252 (98.1)	
Yes	710 (6.1)	398 (11.7)			105 (1.0)	42 (1.9)	

Not all numbers sum up to 27,548 because respondents answering "I do not know" to individual questions were excluded.

N (%) = number of childhood gender conforming (or non-conforming) respondents in the particular group and corresponding demographically weighted column percentages.

[a]Chi-square test.

Childhood gender non-conformity and mental health problems in Denmark

Table 2: Associations between childhood gender non-conformity and mental health problems among 27,548 18 to 89 year-old individuals, Denmark 2017-2018							
	Women				Men		
	N (%)	OR (95% CI)	aOR (95% CI)		N (%)	OR (95% CI)	aOR (95% CI)
Loneliness[a]							
Gender conforming	11427 (30.2)	1 (Ref.)	1 (Ref.)		10740 (23.4)	1 (Ref.)	1 (Ref.)
Gender non-conforming	3049 (41.3)	1.69 (1.55-1.84)	1.47 (1.34-1.62)		2295 (31.2)	1.69 (1.53-1.88)	1.45 (1.29-1.63)
Symptoms of depression within the last 14 days (PHQ2 score)							
Gender conforming	11439 (14.8)	1 (Ref.)	1 (Ref.)		10754 (11.6)	1 (Ref.)	1 (Ref.)
Gender non-conforming	3056 (24.0)	1.82 (1.65-2.02)	1.48 (1.32-1.65)		2299 (17.9)	1.73 (1.53-1.96)	1.51 (1.32-1.73)
Symptoms of anxiety within the last 14 days (GAD7 score)							
Gender conforming	11439 (26.7)	1 (Ref.)	1 (Ref.)		10754 (19.6)	1 (Ref.)	1 (Ref.)
Gender non-conforming	3056 (40.6)	2.05 (1.87-2.25)	1.72 (1.56-1.90)		2299 (27.8)	1.89 (1.70-2.11)	1.63 (1.45-1.83)
Ever received treatment for a mental health problem							
Gender conforming	11368 (36.9)	1 (Ref.)	1 (Ref.)		10709 (21.3)	1 (Ref.)	1 (Ref.)
Gender non-conforming	3033 (48.5)	1.74 (1.59-1.89)	1.54 (1.41-1.70)		2286 (27.1)	1.61 (1.45-1.80)	1.45 (1.29-1.62)
Ever self-harmed (without suicidal intent)							
Gender conforming	11392 (7.9)	1 (Ref.)	1 (Ref.)		10724 (4.7)	1 (Ref.)	1 (Ref.)
Gender non-conforming	3035 (16.0)	2.57 (2.25-2.95)	1.93 (1.66-2.25)		2287 (8.5)	2.38 (1.99-2.84)	1.83 (1.50-2.24)
Ever had suicidal thoughts or attempted suicide							
Gender conforming	11258 (22.2)	1 (Ref.)	1 (Ref.)		10587 (20.8)	1 (Ref.)	1 (Ref.)
Gender non-conforming	3006 (37.7)	2.34 (2.13-2.57)	1.98 (1.78-2.19)		2262 (28.3)	1.82 (1.64-2.03)	1.54 (1.36-1.73)

N (%) = number of childhood gender conforming (or non-conforming) respondents and corresponding demographically weighted proportion reporting the mental health outcome in question.

OR, odds ratio adjusted for age in 10-year categories; aOR, odds ratio adjusted for age in 10-year categories, educational attainment, difficulties paying bills within the last year, partner status, gender identity, sexual identity and childhood sexual assault; CI, confidence interval.

Numbers do not sum up to 27,548 for all mental health outcomes, because respondents answering "I do not know" to individual questions were excluded.

[a]Sometimes/often/always feeling lonely.

Childhood gender non-conformity and mental health problems in Denmark (by sexual identity)

Table 3: Associations between childhood gender non-conformity and mental health problems by sexual identity among 26,426 18 to 89 year-old self-identified heterosexual, homosexual and bisexual individuals, Denmark 2017-2018						
	Heterosexual		*Homosexual*		*Bisexual*	
	N (%)	aOR (95% CI)	N (%)	aOR (95% CI)	N (%)	aOR (95% CI)
Women						
Loneliness[a]						
Gender conforming	10604 (29.6)	1 (Ref.)	124 (32.7)	0.76 (0.38-1.54)	235 (54.2)	1.54 (1.11-2.13)
Gender non-conforming	2438 (39.9)	1.47 (1.33-1.63)	173 (49.6)	1.79 (1.03-3.13)	187 (64.4)	1.94 (1.32-2.85)
Symptoms of depression within the last 14 days (PHQ2 score)						
Gender conforming	10613 (14.1)	1 (Ref.)	124 (9.4)	0.40 (0.12-1.36)	237 (25.2)	1.19 (0.83-1.73)
Gender non-conforming	2442 (23.1)	1.51 (1.34-1.70)	174 (20.1)	1.36 (0.68-2.70)	187 (36.5)	1.86 (1.27-2.72)
Symptoms of anxiety within the last 14 days (GAD7 score)						
Gender conforming	10613 (26.2)	1 (Ref.)	124 (25.8)	0.61 (0.28-1.33)	237 (49.5)	1.36 (0.99-1.88)
Gender non-conforming	2442 (39.0)	1.71 (1.54-1.90)	174 (52.6)	2.40 (1.38-4.19)	187 (67.0)	2.59 (1.75-3.84)
Ever received treatment for a mental health problem						
Gender conforming	10550 (36.9)	1 (Ref.)	124 (41.9)	0.95 (0.50-1.82)	235 (58.0)	1.69 (1.23-2.33)
Gender non-conforming	2424 (47.8)	1.54 (1.39-1.69)	174 (69.3)	2.94 (1.63-5.30)	184 (69.6)	2.22 (1.49-3.29)
Ever self-harmed (without suicidal intent)						
Gender conforming	10576 (7.1)	1 (Ref.)	124 (16.8)	1.47 (0.55-3.92)	234 (38.6)	3.36 (2.33-4.82)
Gender non-conforming	2428 (14.1)	2.11 (1.79-2.48)	174 (26.0)	2.91 (1.48-5.69)	183 (45.5)	3.12 (2.06-4.71)
Ever had suicidal thoughts or attempted suicide						
Gender conforming	10449 (21.5)	1 (Ref.)	123 (27.4)	0.90 (0.43-1.91)	235 (54.2)	2.46 (1.78-3.40)
Gender non-conforming	2404 (36.5)	2.03 (1.82-2.26)	171 (54.3)	3.32 (1.89-5.82)	184 (65.7)	3.14 (2.12-4.65)
Men						
Loneliness[a]						
Gender conforming	10117 (22.7)	1 (Ref.)	219 (42.0)	1.26 (0.80-1.99)	176 (40.1)	1.41 (1.01-1.96)
Gender non-conforming	1853 (29.0)	1.46 (1.29-1.65)	214 (46.7)	1.65 (1.10-2.49)	53 (58.7)	2.37 (1.28-4.38)

Symptoms of depression within the last 14 days (PHQ2 score)								
Gender conforming	10131 (11.3)	1 (Ref.)		219 (5.1)	0.30 (0.12-0.74)		176 (18.8)	1.22 (0.82-1.83)
Gender non-conforming	1856 (17.5)	1.55 (1.34-1.78)		214 (9.2)	0.50 (0.25-0.98)		53 (25.3)	0.91 (0.44-1.90)
Symptoms of anxiety within the last 14 days (GAD7 score)								
Gender conforming	10131 (19.1)	1 (Ref.)		219 (27.1)	1.20 (0.75-1.95)		176 (34.1)	1.47 (1.05-2.04)
Gender non-conforming	1856 (25.8)	1.58 (1.40-1.79)		214 (41.1)	2.11 (1.39-3.18)		53 (64.9)	4.10 (2.26-7.46)
Ever received treatment for a mental health problem								
Gender conforming	10090 (20.9)	1 (Ref.)		218 (37.0)	1.71 (1.10-2.65)		175 (38.2)	1.74 (1.27-2.38)
Gender non-conforming	1847 (25.5)	1.43 (1.27-1.61)		213 (46.2)	2.49 (1.68-3.70)		52 (47.6)	2.29 (1.29-4.06)
Ever self-harmed (without suicidal intent)								
Gender conforming	10103 (4.4)	1 (Ref.)		218 (5.1)	0.67 (0.26-1.77)		175 (17.6)	2.86 (1.84-4.44)
Gender non-conforming	1848 (7.0)	1.81 (1.46-2.25)		213 (16.7)	2.58 (1.44-4.60)		53 (36.5)	5.27 (2.71-10.25)
Ever had suicidal thoughts or attempted suicide								
Gender conforming	9979 (20.1)	1 (Ref.)		214 (37.8)	1.57 (1.00-2.48)		174 (47.2)	2.42 (1.76-3.32)
Gender non-conforming	1829 (26.5)	1.55 (1.37-1.76)		210 (50.3)	2.62 (1.75-3.91)		52 (55.7)	2.33 (1.28-4.25)

N (%) = number of childhood gender conforming (or non-conforming) respondents and corresponding demographically weighted proportion reporting the mental health outcome in question.

aOR, odds ratio adjusted for age in 10-year categories, educational attainment, difficulties paying bills within the last year, partner status, gender identity and childhood sexual assault; CI, confidence interval.

Numbers do not sum up to 26,426 for all mental health outcomes, because respondents answering "I do not know" to individual questions were excluded.

[a]Sometimes/often/always feeling lonely.

Supplementary methods

Study participants

We used baseline data from Project SEXUS, a prospective Danish cohort study established in 2017 with a probability-based sample of 62,675 15 to 89 year-old individuals. The focus of Project SEXUS is to study a broad range of sexual health measures and to explore the interplay between sexual and general health. An individual weighting procedure ensured national representativeness with respect to sex, year of birth, region of residence, marital status, cultural background and twin status. Details concerning Project SEXUS participants, sampling procedure, questionnaire and participation rate are provided elsewhere (1–4).

To save space and cover more topics in the comprehensive questionnaire, some questions, including one item about recalled childhood gender non-conformity, were only presented to approximately half of participants. In the present study, we analyzed data from that subset of 27,548 Project SEXUS respondents aged 18 to 89 years who answered the question about childhood gender non-conformity.

Measures

Recalled childhood gender non-conformity

To capture childhood gender non-conformity, respondents assigned female sex at birth were asked »*How well, or how poorly, does the following statement fit you: As a child or young person, I had difficulties living up to other peoples' perception of "a real girl"*«, and respondents assigned male sex at birth were asked the same question, with *"a real girl"* replaced by *"a real boy"*. Response categories were *very well*, *well*, *neither well nor poorly*, *poorly*, *very poorly* and *I do not know*. Respondents answering that the statement fitted them *well* or *very well* were considered as childhood gender non-conforming.

Mental health outcomes

Respondents were asked how often they felt lonely, with response categories *never*, *rarely*, *sometimes*, *often* and *always*. We considered responses *sometimes*, *often* and *always* as an indicator of loneliness. To capture symptoms of depression or anxiety within the last 14 days, respondents were presented with the two-item Patient Health Questionnaire (PHQ-2) and the seven-item Generalized Anxiety Disorder (GAD-7) scales. Respondents with a PHQ-2 score ≥3 were considered to have depressive symptoms, while respondents with a GAD-7 score ≥5 were considered to have anxiety symptoms (5,6). Additionally, respondents were asked if they had ever received treatment by a doctor, a psychologist or a similar professional for a mental health problem, if they had ever self-harmed without suicidal intent and if they had ever had suicidal thoughts with or without actual suicide attempts.

Sex and gender identity

The sex of study participants was determined by their officially recorded sex (*woman*, *man*) in the Danish Civil Registration System at the time of data extraction for the baseline Project SEXUS data collection in 2017 (4,7). Further, questions about sex assigned at birth (*male*, *female*, *I do not know*), currently perceived gender (*male, female, both male and female, neither male nor female, I do not know*), history of legal sex change (*no, yes – from male to female, yes – from female to male*) and self-perception as a trans person (*yes, no*, *I do not know*), enabled us to dichotomize gender identity in the present study, as follows: *a)* Cisgender individuals comprising respondents reporting congruence (male-male or female-female) between their sex assigned at birth and their currently perceived gender and *b)* non-cisgender comprising all other respondents.

Sexual orientation

Respondents were asked how they would describe their sexual identity with the following response categories: *I am heterosexual, I am homosexual (gay or lesbian), I am bisexual, I am asexual, I cannot place myself in the categories listed above* and *I do not know/I am undecided*. Respondents also provided answers to questions about other-sex and same-sex sexual

experiences and about the degrees to which they had felt sexually attracted to persons of the other sex and their own sex since age 15 years.

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