

# THE LANCET

## Child & Adolescent Health

### Supplementary appendix

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## SUPPLEMENTARY MATERIAL

### **Mental health, social adversity, and health-related outcomes in sexual minority adolescents: a contemporary national cohort study**

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**Table S1.** Outcome measures and how they are assessed and coded in analysis

<b>Variable</b>	<b>Question asked /measure used</b>	<b>Variable recoding</b>	<b>Variable name</b>
Sexual attraction†	‘Have you ever been attracted to a female/male?’	Heterosexual = attracted to opposite sex/not attracted to same sex Sexual minority = Attracted to same sex/both sexes	<b>Sexual attraction</b>
<b><i>Mental Health</i></b>			
Depressive symptoms	Short mood and feelings questionnaire <sup>1</sup> This is a 13-item measure with a 0-2 response scale (0=Not true, 2= True). (Cronbach's $\alpha = \cdot93$ )	Score total on measure (continuous) Exceeds/equal to a clinical score of $>=12$ (binary) 0 = Non-clinical 1 = Clinical	<b>Depressive symptoms</b> <b>Above depressive symptoms cut-off</b>
Subjective wellbeing	On a scale of 1 to 7 where ‘1’ means completely happy and ‘7’ means not at all happy, how do you feel about the following parts of your life? (Cronbach's $\alpha = \cdot84$ )  - Your schoolwork - The way you look - Your family - Your friends - The school you go to - Your life as a whole	Addition of all items = score total (continuous )	<b>Subjective wellbeing Score</b>
Life satisfaction	Using response to the 'your life as a whole' question.	0 = Happy (responses 1-4) 1 = Less/not at all happy (responses 5-7)	<b>Low life satisfaction</b>
Self-harm	‘In the past year have you hurt yourself on purpose in any way?’	0 = No 1 = Yes	<b>Self-harm</b>
Self-esteem	5 Positive self-esteem items were used from the Rosenberg scale. <sup>2</sup> (Cronbach's $\alpha = \cdot90$ )	Addition of all items = score total (continuous)	<b>Low Self-esteem</b>
<b><i>Anti-social behaviours</i></b>	‘In the last 12 months have you done any of the following things?’  - Stolen something from someone. e.g. a mobile phone, money etc.? - Pushed or shoved/hit/slapped/punched someone? - Used or hit someone with a weapon?	0 = No 1 = Yes	<b>Stole from another person</b> <b>Hit another person</b> <b>Hit someone with a weapon</b>

**Health-related outcomes**

Smoking	<p>‘Please read the following statements carefully and decide which one best describes you.’</p> <ul style="list-style-type: none"> <li>- 1= I have never smoked cigarettes</li> <li>- 2= I have only ever tried smoking cigarettes once</li> <li>- 3= I used to smoke sometimes but I never smoke a cigarette now</li> <li>- 4= I sometimes smoke cigarettes now, but I don’t smoke as many as one a week</li> <li>- 5= I usually smoke between one and six cigarettes a week</li> <li>- 6= I usually smoke more than six cigarettes a week</li> </ul>	<p>0 = Never smoked (a response of 1) 1 = Ever smoked (responses 2-6)</p> <p>0 = Non-regular smoker (1- 4 response) 1 = Regular smoker (5-6 response)</p>	<p><b>Ever smoked</b></p> <p><b>Regular smoking</b></p>
Drinking alcohol	<p>‘Have you ever had an alcoholic drink? That is more than a few sips?’</p> <p>‘How many times have you had an alcoholic drink in the last 4 weeks?’</p> <ul style="list-style-type: none"> <li>- 1 = Never</li> <li>- 2 = 1-2 times</li> <li>- 3 = 3-5 times</li> <li>- 4 = 6-9 times</li> <li>- 5 = 10-19 times</li> <li>- 6 = 20-39 times</li> <li>- 7 = 40 or more times</li> </ul>	<p>0 = No 1 = Yes</p> <p>0 = Not a regular drinker (1-4 response) 1 = Regular drinker (5-7 response)</p>	<p><b>Ever drank alcohol</b></p> <p><b>Regular drinking</b></p>
Drug use	<p>‘Have you ever tried any of the following things?’</p> <ul style="list-style-type: none"> <li>- Cannabis (also known as weed, marijuana, dope, hash or skunk)?</li> <li>- Any other illegal drug (such as ecstasy, cocaine, speed)?</li> </ul> <p>‘How many times have you used or smoked cannabis or weed?’</p> <ul style="list-style-type: none"> <li>- 1 = Once or twice</li> <li>- 2 = Three or four times</li> <li>- 3 = Five to ten times</li> <li>- 4 = More than ten times</li> </ul>	<p>0 = No 1 = Yes</p> <p>0 = Non regular use (response of 1) 1 = Regular cannabis use (response of 2-4)</p>	<p><b>Cannabis use /Other drug use</b></p> <p><b>Regular cannabis use</b></p>
Sexual activity	<p>‘In the last 12 months have you had sexual intercourse with another young person?’</p>	<p>0 = No 1 = Yes</p>	<p><b>Sexual activity</b></p>

Risky sex	‘The last time you had sex which of the following did you do?’	0 = Not risky sex (responses of 1 -2) 1 = Risky sex (a response of 3)	<b>Engaged in risky sex *</b>
	<ul style="list-style-type: none"> <li>- 1 = Used a condom</li> <li>- 2 = Used another form of contraceptive</li> <li>- 3 = Did not use any contraception</li> </ul>		
Overweight/obese	International obesity taskforce (IOTF) thresholds were calculated for adolescents as follows:	0 = Not overweight 1 = Overweight/obese	<b>Overweight/obese</b>
	<ul style="list-style-type: none"> <li>- 0 = Not overweight (including underweight)</li> <li>- 1 = Overweight</li> <li>- 2 = Obese</li> </ul>		
Weight perception	‘Which of these do you think you are?’	0 = Does not perceive self as overweight (responses 1-2) 1 = Perceives self as overweight (responses 3-4)	<b>Perceives self as overweight</b>
	<ul style="list-style-type: none"> <li>- 1 = Underweight</li> <li>- 2 = About the right weight</li> <li>- 3 = Slightly overweight</li> <li>- 4 = Very overweight</li> </ul>		
Physically inactive	‘How many days in the last week were spent doing vigorous physical activity?’	Continuous variable	<b>Physically inactive</b>
	<ul style="list-style-type: none"> <li>- 1 = Everyday</li> <li>- 2 = 5-6 days</li> <li>- 3 = 3-4 days</li> <li>- 4 = 1-2 days</li> <li>- 5 = Not at all</li> </ul>		
Dieted to lose weight	‘Have you ever eaten less food, fewer calories, or foods low in fat to lose weight or to avoid gaining weight?’	0 = No 1 = Yes	<b>Dieted to lose weight</b>
Exercised to lose weight	‘Have you ever exercised to lose weight or to avoid gaining weight?’	0 = No 1 = Yes	<b>Exercised to lose weight</b>
<b>Interpersonal difficulties</b>			
Bullying	On a scale of 1-6 (1= Never, 6 = Most days):	Continuous variable	
	<ul style="list-style-type: none"> <li>- How often do other children hurt you or pick on you on purpose?</li> <li>- How often have other children sent you unwanted or nasty emails, texts or messages or posted something nasty about you on a website?</li> </ul>	0 = not bullied (Once a month or less) 1 = bullied (At least once a week) ††	<b>Peer bullying</b> <b>Cyber bullying</b>

	- How often do you hurt or pick on your brothers or Sisters on purpose?		<b>Sibling bullying</b>
Victimisation	'In the past 12 months has anyone done any of these things to you?'	0 = No 1 = Yes	
	- Insulted you, called you names, threatened or shouted at you in a public place, at school or anywhere else?		<b>Verbally assaulted</b>
	- Been physically violent towards you, e.g. pushed, shoved, hit, slapped or punched you?		<b>Physically assaulted</b>
	- Hit you with or used a weapon against you?		<b>Hit with a weapon</b>
	- Stolen something from you e.g. a mobile phone, money etc.?		<b>Stolen from</b>
	- Made an unwelcome sexual approach to you or assaulted you sexually?		<b>Sexually assaulted</b>
Friendship	'Do you have any close friends?'	0 = No 1 = Yes	<b>Close friends</b>
Parental relations	'Overall, how close would you say you are to your mother/father?'	Continuous variable	<b>Not close to mother/father</b>
	- 1 = Not very close	0 = Close to mother/father (responses 2-4)	
	- 2 = Fairly close	1 = Not close to mother/father (response 1)	
	- 3 = Very close		
	- 4 = Extremely close		
	'How often do you argue with your mother/father?'	0 = Infrequently (responses 3-5) 1 = Frequently (responses 1-2)	<b>Argues with mother/father often</b>
	- 1= Most days		
	- 2= More than once a week		
	- 3= Less than once a week		
	- 4= Hardly ever		
	- 5= Never		
<b>Cumulative difficulties</b>	All binary scores were summed and means scores calculated in the following domains:	Percentages and averages were used for both groups	<b>Cumulative difficulties</b>
	- Mental health		
	- Anti-social behaviours		
	- Health-related behaviours		
	- Interpersonal difficulties		
	- All		

†Sex is recorded in this study as the biological assigned sex at birth, which helped the formation of this variable.

\*If a participant answered no to having engaged in sexual activity, they would not be asked the question about safe sex. ††Binary transformation based on transformation used in previous literature<sup>3</sup>

**Table S2.** Correlations among all variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1. Depressive symptoms	1																													
2. Low life satisfaction	0.58	1																												
3. Self-harm	0.52	0.34	1																											
4. Self-esteem	0.6	0.58	0.35	1																										
5. Sibling bullying	0.2	0.19	0.12	0.15	1																									
6. Peer bullying	0.28	0.24	0.19	0.18	0.22	1																								
7. Cyber Bullying	0.24	0.15	0.21	0.14	0.11	0.33	1																							
8. Verbally assaulted	0.35	0.27	0.24	0.23	0.15	0.31	0.16	1																						
9. Physically assaulted	0.25	0.19	0.18	0.11	0.13	0.28	0.15	0.4	1																					
10. Hit with a weapon	0.18	0.15	0.12	0.09	0.08	0.14	0.15	0.18	0.3	1																				
11. Stolen from	0.18	0.16	0.14	0.11	0.09	0.17	0.15	0.18	0.24	0.2	1																			
12. Sexually assaulted/harassed	0.21	0.14	0.19	0.13	0.05	0.11	0.12	0.13	0.11	0.11	0.13	1																		
13. Close friends	-0.06	-0.1	-0.03	-0.5	-0.01	-0.09	-0.03	-0.04	-0.06	-0.03	-0.02	-0.06	1																	
14. Close to mother	-0.28	-0.36	-0.17	-0.3	-0.14	-0.11	-0.07	-0.13	-0.08	-0.08	-0.07	-0.08	0.05	1																
15. Close to father	-0.26	-0.34	-0.16	-0.27	-0.1	-0.08	-0.06	-0.12	-0.09	-0.07	-0.06	-0.08	0.02	0.43	1															
16. Argues with mother often	0.26	0.25	0.18	0.19	0.2	0.12	0.09	0.14	0.13	0.08	0.07	0.08	-0.02	-0.26	-0.14	1														
17. Argues with father often	0.19	0.19	0.14	0.11	0.16	0.14	0.08	0.13	0.12	0.09	0.07	0.04	-0.05	-0.1	-0.17	0.38	1													
18. Stole from another person	0.09	0.1	0.07	0.06	0.05	0.05	0.05	0.06	0.11	0.13	0.15	0.11	-0.01	-0.05	-0.03	0.05	0.06	1												
19. Hit another person	0.14	0.14	0.11	0.03	0.09	0.12	0.07	0.27	0.43	0.17	0.16	0.07	-0.02	-0.12	-0.09	0.16	0.12	0.11	1											
20. Hit someone with a weapon	0.05	0.06	0.06	0.001	0.05	0.05	0.01	0.06	0.12	0.28	0.11	0.05	-0.01	-0.27	-0.04	0.02	0.06	0.21	0.15	1										
21. Ever drank alcohol	-0.21	-0.19	-0.19	-0.17	-0.05	-0.03	-0.04	-0.19	-0.16	-0.07	0.1	-0.09	-0.05	0.13	0.11	-0.15	-0.09	-0.06	-0.2	-0.08	1									
22. Ever smoked	0.22	0.21	0.2	0.16	0.05	0.04	0.08	0.13	0.14	0.11	0.11	0.12	0.008	-0.16	-0.18	0.15	0.09	0.06	0.18	0.09	-0.32	1								

23. Ever used cannabis	0.18	0.15	0.15	0.1	0.03	0.03	0.09	0.1	0.13	0.12	0.11	0.13	-0.05	-0.13	-0.13	0.11	0.07	0.1	0.16	0.12	-0.22	0.47	1							
24. Other drug use	0.09	0.06	0.1	0.03	0.006	0.05	0.11	0.04	0.07	0.1	0.06	0.1	-0.03	-0.08	-0.07	0.07	0.06	0.08	0.09	0.14	-0.08	0.16	0.33	1						
25. Sexual activity	0.15	0.11	0.15	0.1	0.03	0.03	-0.03	-0.02	-0.06	0.02	-0.002	0.01	-0.06	-0.12	-0.17	0.12	0.002	0.07	-0.02	0.06	-0.15	0.29	0.35	0.17	1					
26. Overweight/obese	0.08	0.09	0.04	0.11	0.02	0.02	0.02	0.04	0.02	0.02	0.04	0.02	-0.01	0.01	-0.04	-0.001	0.004	0.002	0.002	0.01	-0.04	0.05	0.03	-0.01	-0.04	1				
27. Physically inactive	0.12	0.14	0.05	0.19	0.02	0.04	-0.01	0.02	-0.05	-0.02	-0.05	0.02	-0.06	-0.07	-0.1	-0.02	-0.01	0.01	-0.09	-0.02	0.05	-0.02	-0.03	-0.01	0.13	0.11	1			
28. Exercised to lose weight	0.18	0.14	0.12	0.16	0.05	0.008	0.03	0.07	0.04	0.02	0.05	0.05	0.06	-0.04	-0.04	0.05	0.03	0.04	0.04	0.003	-0.11	0.09	0.05	0.02	0.01	0.27	-0.05	1		
29. Dieted less to lose weight	0.29	0.21	0.21	0.25	0.1	0.02	0.07	0.11	0.05	0.02	0.08	0.08	0.03	-0.06	-0.09	0.09	0.06	0.04	0.03	0.0002	-0.11	0.1	0.06	0.02	0.07	0.3	0.03	0.51	1	
30. Perceives self as overweight	0.23	0.22	0.15	0.27	0.07	0.06	0.04	0.09	0.04	0.03	0.04	0.05	-0.02	-0.07	-0.08	0.07	0.05	0.03	0.02	0.02	-0.07	0.09	0.04	0.01	0.1	0.15	0.15	0.31	0.4	1

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**Table S3.** Descriptive statistics, means, percentages and 95% confidence intervals split by sexual attraction type.

		<b>Bisexual attraction</b> <b>n = 576</b>	<b>Same sex attraction</b> <b>n = 50</b>
<b><i>Mental health</i></b>			
Depressive symptoms	(n = 571/48)	13.07 [12.44, 13.70]	9.29 [6.97, 11.61]
Above clinical cut off %	(n = 571/48)	56.15 [50.92, 61.25]	31.21 [17.97, 48.45]
Subjective wellbeing score†	(n = 572/48)	20.53 [19.91, 21.15]	17.66 [15.55, 19.77]
Low life satisfaction %	(n = 575/49)	34.75 [29.79, 40.08]	31.74 [16.57, 52.11]
Self-harm %	(n = 571/49)	54.13 [48.84, 59.33]	48.97 [31.77, 66.41]
Self-esteem	(n = 569/49)	11.92 [11.62, 12.21]	10.71 [9.59, 11.83]
<b><i>Anti-social behaviours</i></b>			
Stole from another person %	(n = 575/50)	3.13 [1.82, 5.32]	2.75 [0.36, 18.18]
Hit another person %	(n = 576/50)	33.91 [29.22, 38.94]	37.84 [21.81, 57.04]
Hit someone with a weapon %	(n = 576/50)	1.26 [0.51, 3.10]	..
<b><i>Health related outcomes</i></b>			
Ever drank alcohol%	(n = 575/50)	68.84 [63.75, 73.52]	51.49 [33.93, 68.70]
Regular drinking %	(n = 359/25)	1.10 [0.36, 3.33]	0.58 [0.07, 4.78]
Ever smoked %	(n = 572/50)	34.58 [29.65, 39.86]	34.77 [20.12, 53.00]
Regular smoking %	(n = 572/50)	5.85 [3.76, 9.01]	10.12 [3.67, 24.97]
Ever used cannabis %	(n = 574/50)	16.30 [12.36, 21.19]	10.04 [3.52, 25.46]
Regular cannabis use %	(n = 70/5)	35.84 [22.76, 51.42]	27.77 [1.86, 88.64]
Other drug use %	(n = 575/50)	1.72 [0.79, 3.68]	2.79 [0.65, 11.22]
Sexual activity %	(n = 76/7)	42.25 [29.28, 56.39]	66.22 [18.24, 94.51]
Risky sex %	(n = 29/4)	15.24 [4.91, 38.50]	..
Overweight/obese %	(n = 545/47)	33.09 [28.22, 38.35]	33.96 [19.50, 52.18]
Physically inactive	(n = 576/50)	3.22 [3.13, 3.31]	3.07 [2.69, 3.44]
Exercised to lose weight%	(n = 576/50)	67.71 [62.48, 72.52]	50.54 [33.15, 67.81]
Dieted to lose weight %	(n = 574/50)	66.60 [61.31, 71.50]	53.45 [35.54, 70.52]
Perceives self as overweight %	(n = 576/50)	49.61 [44.39, 54.84]	50.04 [32.75, 67.32]
<b><i>Interpersonal difficulties</i></b>			
Sibling bullying %	(n = 530/49)	38.26 [32.94, 43.87]	23.85 [12.65, 40.37]
Frequency of sibling bullying	(n = 530/49)	3.28 [3.12, 3.45]	2.63 [2.10, 3.17]
Peer bullying %	(n = 575/50)	27.32 [22.88, 32.26]	25.84 [14.31, 42.09]
Frequency of peer bullying	(n = 575/50)	2.96 [2.81, 3.10]	2.39 [1.87, 2.90]
Cyber Bullying %	(n = 573/50)	8.18 [5.69, 11.62]	0.89 [0.19, 4.13]
Frequency of cyber bullying	(n = 573/50)	2.03 [1.92, 2.14]	1.66 [1.34, 1.97]
Verbally assaulted %	(n = 576/50)	67.03 [62.03, 71.67]	52.32 [34.86, 69.24]
Physically assaulted %	(n = 574/50)	35.74 [30.82, 40.99]	24.91 [13.80, 40.73]
Hit with a weapon %	(n = 575/50)	6.81 [4.29, 10.64]	2.46 [0.32, 16.58]
Stolen from %	(n = 575/50)	12.48 [9.47, 16.27]	11.54 [4.84, 25.06]
Sexually assaulted/harassed %	(n = 575/50)	11.51 [8.68, 15.13]	6.91 [2.55, 17.39]
Close friends %	(n = 576/50)	97.31 [95.25, 98.49]	86.04 [58.56, 96.41]

Not close to mother%	(n = 565/49)	9.14 [6.25, 13.19]	4.59 [0.95, 19.48]
Not close to father%	(n = 519/47)	16.84 [13.08, 21.43]	17.26 [8.37, 32.29]
Close to mother	(n = 565/49)	2.83 [2.75, 2.90]	2.89 [2.62, 3.16]
Close to father	(n = 519/47)	2.49 [2.41, 2.57]	2.48 [2.21, 2.75]
Argues with mother often %	(n = 563/49)	41.83 [36.58, 47.27]	29.65 [17.22, 46.08]
Argues with father often %	(n = 519/47)	23.78 [19.58, 28.56]	25.15 [11.01, 47.71]

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†Maximum score is 49, higher scores indicate less subjective wellbeing.

**Sexual & gender minority**

- Non-Heterosexuals
- Non Heterosexuals
- Non-Heterosexual
- Sexual Dissidents
- Dissident, Sexual
- Dissidents, Sexual
- Sexual Dissident
- GLBT Persons
- GLBT Person
- Person, GLBT
- Persons, GLBT
- GLBTQ Persons
- GLBTQ Person
- Person, GLBTQ
- Persons, GLBTQ
- LGBT Persons
- LGBT Person
- Person, LGBT
- Persons, LGBT
- LGBTQ Persons
- LGBTQ Person
- Person, LGBTQ
- Persons, LGBTQ
- Lesbian Persons
- Lesbian Person
- Person, Lesbian
- Persons, Lesbian
- Non-Heterosexual Persons
- Non Heterosexual Persons
- Non-Heterosexual Person
- Person, Non-Heterosexual
- Sexual Minorities
- Minorities, Sexual
- Minority, Sexual
- Sexual Minority
- LBG Persons
- LBG Person
- Person, LBG
- Persons, LBG
- Gays
- Gay
- Men Who Have Sex With Men
- Gender Minorities
- Gender Minority
- Minorities, Gender
- Minority, Gender
- Lesbians
- Lesbian
- Women Who Have Sex with Women
- Bisexuals
- Bisexual

- Homosexuals
- Homosexual
- Queers
- Queer

## **Health**

- Adolescent Health
- Cardiorespiratory Fitness
- Child Health
- Family Health
- Global Health
- Holistic Health
- Infant Health
- Men's Health
- Mental Health
- Minority Health
- Occupational Health
- One Health
- Oral Health
- Physical Fitness
- Cardiorespiratory Fitness
- Physical Functional Performance +
- Population Health
- Rural Health
- Suburban Health
- Urban Health
- Public Health
- Reproductive Health
- Sexual Health
- Social Determinants of Health
- Veterans Health
- Women's Health
- Maternal Health

## **Population characteristics**

- Characteristic, Population
- Characteristics, Population
- Population Characteristic
- Population Statistics
- Statistics, Population
- Population Heterogeneity
- Heterogeneity, Population

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