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Short communication

Development and validation of the sexual wellbeing in Adolescence Scale (Adol-SW): A brief measure for adolescent health surveys

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ABSTRACT

Purpose: Sexual development is a core biopsychosocial process in adolescence. Lack of brief measures of sexual wellbeing for this age group limits understanding of the impact of these processes on broader mental health and wellbeing. This study aimed to develop and validate a brief measure of sexual wellbeing for mid-to-late adolescents (aged 14-19), suitable for use in population surveys.

Methods: Measure development was informed by seven agenda-setting workshops with young people (n = 28, aged 14-23), parents (n = 4), and professionals (n = 11) followed by five online focus groups with adolescents (n = 38, aged 14-19). New items were tested and iteratively refined via cognitive interviews with adolescents (n = 18) and expert review (n = 4). Data from a web-based survey of UK adolescents (n = 1710; aged 14-19) were used to assess and eliminate poor performing items. Exploratory and confirmatory factor analyses assessed latent structure, model fit, measurement invariance, and associations with external validation criteria to ensure standardisation and applicability.

Results: An initial 33-item pool was reduced to 13 items representing four first-order factors: support, comfort/respect, safety/agency, and self-esteem, The final model showed good fit (RMSEA 0.064; CFI 0.954; TLI 0.941). Measurement invariance was supported across age groups but only partially across gender. Higher overall sexual wellbeing scores were positively associated with body image, general wellbeing, and sexual and reproductive empowerment, and negatively associated with depression and anxiety.

Conclusion: The 13-item Adol-SW is the first validated, brief measure of adolescent sexual wellbeing explicitly designed for population surveys to improve understanding of links between adolescent sexual development and mental wellbeing.

1. Introduction

Sexual development is a normal and healthy part of adolescence (Tolman and McClelland, 2011). This period is commonly marked by an increased awareness of sexual feelings, the initiation of partnered sexual activity, and the consolidation of gender and sexual identities (Tolman and McClelland, 2011; Kar et al., 2015). Whilst often positive, these experiences can involve challenges, such as shame, stigma and discrimination (Pachankis et al., 2020), with lasting implications for mental health (Kar et al., 2015).

Large national and international adolescent health surveys routinely assess sleep, exercise, family and peer relationships, substance use, social media use and academic pressures but rarely include experiences related to sexuality development. When included, questions mostly focus on age at first intercourse, sexual orientation or risk behaviours (e.g., contraceptive/condom non-use) (Health Behaviour in School-Aged

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Children (HBSC) Study). These reflect a predominant focus of adolescent sexuality research on adversity - such as sexual violence (Clarke et al., 2023), sexually transmitted infections (Bahnsen et al., 2023), and unintended pregnancy (Siegel and Brandon, 2014) - and a common framing of adolescent sexuality as a risk factor for detrimental health outcomes (Tolman and McClelland, 2011).

As a result of the lack of questions on psychosexual aspects of sexuality, there are key gaps in research. For instance, little is known about whether and how positive sexual experiences contribute to adolescent mental wellbeing (Hensel et al., 2016) or how poor mental health shapes adolescent sexual development. The dearth of research is at odds with adolescent priorities; in a recent global priority-setting exercise, adolescents identified the interplay between mental health challenges and sexual health as a major concern (Lohan et al., 2025). Discrepancy between the questions addressed by researchers and the answers sought by adolescents likely contributes to a system of interventions and services designed for adolescents but discordant with their actual needs.

1.1. Background to sexual wellbeing

Our approach to conceptualising and measuring sexual wellbeing draws on a framing of wellbeing as 'feeling good and functioning well' (Ruggeri et al., 2020) and involves hedonic (affect), and eudaimonic wellbeing (meaning and relationships)(Ryan and Deci, 2001). The task is therefore to establish what 'feeling good and functioning well' looks like in relation to sex and sexuality.

Although frequently invoked, the term sexual wellbeing is often conflated with sexual health or sexual function (Lorimer et al., 2019), obscuring broader emotions and cognitions that people consider central to wellbeing. Via qualitative research with adults and a Delphi study, we previously developed and refined a framework of sexual wellbeing comprising six domains: sexual respect, sexual agency, sexual safety, sexual self-esteem, comfort with sexuality and support (Mitchell et al., 2021, 2023; Lewis et al., 2025, 2026). Here we use these domains as a foundational framework to develop a measure of sexual wellbeing relevant to the unique developmental context of adolescence.

1.2. Existing conceptualisation and measurement of sexual wellbeing in adolescence

We integrated our research focused on adults with several key frameworks for positive adolescent sexual development. Hensel and Fortenberry proposed a holistic sexual health framework for adolescent women, integrating dimensions of wellbeing (Hensel et al., 2011), while Harden advanced a sex-positive framework encompassing self-efficacy, self-esteem, pleasure and satisfaction (Harden, 2014). Kågesten and van Reeuwijk outlined a competency-based model emphasising sexual literacy, gender-equality, consent, and interpersonal skills (Kågesten and van Reeuwijk, 2021). Finally, Remmerie et al. co-created a culturally sensitive framework of young people's sexual wellbeing, highlighting supportive environments, capabilities (e.g. for consent, pleasure), and positive subjective experiences (Remmerie et al.).

To our knowledge there are no measures of adolescent sexual wellbeing as an explicitly defined multidimensional construct, despite repeated calls for such work (Plan International, 2022). Several measures capture dimensions aligned with our model of sexual wellbeing, most often relating to sexual self-esteem, sexual agency, sexual comfort and sexual respect. However, many include items irrelevant to adolescents with limited or no partnered sexual experience, and their length (>15 items) limits use in general health surveys. We identified the need for a brief measure (<15 items), focused on cognitions and emotions, relevant to adolescents regardless of whether they are having sex, and viable for use in population surveys and intervention evaluations.

2. Methods

We developed the Adolescent Sexual Wellbeing Scale (Adol-SW) using a mixed-method development process to ensure content validity, contextual relevance and psychometric performance (Boateng et al., 2018), as summarised in Fig. 1.

2.1. Conceptual development work

The Adol-SW was developed as part of the Good Measure project (goodmeasure.glasgow.ac.uk), which aimed to advance understanding of the links between adolescent sexuality and mental health. We began by conducting four online agenda-setting workshops with young people (n = 28, aged 14-23), and one workshop each with parents of adolescents aged 14-19 (n = 4), and research (n = 8) and policy (n = 3) professionals. Young people were recruited via a network of youth organisations and an LGBTQ + group to ensure variation in gender and sexuality. Parents were recruited via the McPin Foundation parent network. Practitioners and policy professionals represented the education sector, a mental health charity and government health department, and researchers were experts in adolescent health and measure development; all were recruited via professional networks. Using an online collaboration tool (Miro.com), participants were presented with a blank whiteboard and invited to contribute examples of where they felt sexual experiences impact mental health (and vice versa) both positively and negatively. They discussed and voted on the key issues/topics raised (each participant cast 3 votes). The research team subsequently mapped findings against the six domains of sexual wellbeing (sexual respect, sexual self-esteem, comfort with sexuality, sexual safety, sexual agency and support in one's sexual life)(Lewis et al., 2026) and existing frameworks of adolescent sexuality (Hensel et al., 2011; Harden, 2014; Kågesten and van Reeuwijk, 2021; Remmerie et al.) to assess similarities and differences.

2.2. Item generation and refinement

We conducted five online focus groups with adolescents (n = 38, aged 14-19) to explore understanding and experiences (own and perceived others) relevant to sexual wellbeing. Participants were recruited via a specialist youth research agency (www.childwise.co.uk) and an LGBTQ + group, using quota sampling to ensure variation in age and gender. Focus groups were divided by age and gender: girls aged 16-19 (n = 6), boys aged 16-19 (n = 6), girls aged 14-15 (n = 6), boys aged 14-15 (n = 7), LGBTQ + young people aged 14-19 (n = 13)

Focus groups were facilitated via online whiteboards (Miro.com), using interactive activities and scenario-based discussions. Participants reflected on scenarios (e.g., feeling unsure who you are attracted to; starting a new relationship; kissing for the first time; being shown a sexual image for the first time) and discussed in each scenario what the individual depicted might be feeling good or bad about, and their views about what likely influenced those feelings. We then introduced the priority topics identified in the agenda-setting workshops and asked participants to indicate the three topics that mattered to them most. Finally, we asked their advice on questions they would want to see in a survey for adolescents and their views on phrasing and terminology.

From the focus groups and expert input, we generated an initial pool of 33-items. These items were reviewed by our Youth Advisory Group and a panel of experts in adolescent mental health and measure development. We then conducted cognitive interviews with 18 participants recruited over three waves through the same organisations as the focus groups. Participants were seven boys aged 14-19, seven girls aged 14-19 and four LGBTQ + young people aged 14-19. Interview methods included 'think aloud' and 'in your own words' instructions to assess comprehension, clarity and acceptability of items (Willis, 2005). Items were refined iteratively. After each round of cognitive testing, items were revised, reviewed by experts and our Youth Advisors, and re-tested

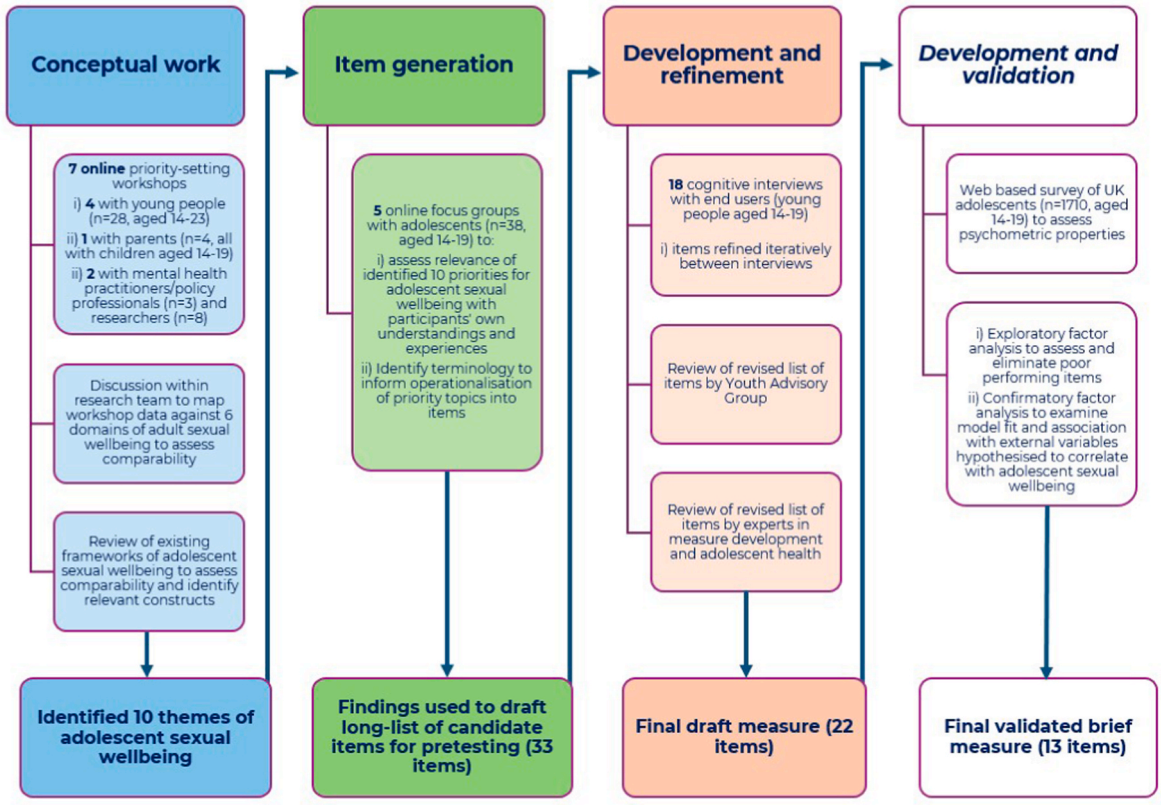

Fig. 1. Summary of measure development and validation process.

with a fresh sample of participants. This process was repeated (three waves) until saturation was reached (Meadows, 2021).

2.3. Development and validation

We undertook a web-based survey of UK adolescents (n = 1710, aged 14–19) to test the psychometric properties of the draft measure. Participants were recruited through youth work services and via targeted social media advertisements run by a youth marketing agency (www.wearerocket.co.uk). This combined online-offline recruitment strategy was designed to include a wide range of adolescents. Quota targets were set based on age, gender, sexual attraction, ethnicity and region. The sample target size of 1500 was based on Comrey and Lee's threshold for an "excellent" sample size, reducing the risk of chance correlation (Comrey and Lee, 2013). The research team programmed the survey in Qualtrics and shared the link with recruiting organisations. Multiple validation checks were embedded within the survey platform prior to data collection (age/region checks, hidden questions), and additional quality assurance and consistency checks were applied during data cleaning (IP filters, bot detection) to ensure data quality and prevent fraudulent responses. A sample breakdown for the survey is shown in Table 1.

2.4. Comparison measures and variables

As no validated measure of adolescent sexual wellbeing currently exists, testing for criterion validity was not possible. Convergent validity was assessed through related constructs hypothesised *a priori* to correlate with adolescent sexual wellbeing including mental wellbeing (Tennant et al., 2007), body image (House of Commons Select Committee, 2020), anxiety (Spitzer et al., 2006), depression (Löwe et al., 2005), positive sexuality (Maes et al., 2023), sexual and reproductive empowerment (Upadhyay et al., 2021) and sexuality-related stress and support (Bedard-Thomas et al., 2019).

Ethical approval

Ethical approval for the agenda-setting workshops and youth advisory group was granted by University of Glasgow MVLS ethics committee reference (200220184 01/04/2023). Ethical approval for the cognitive interviews, measure development and validation was granted by University of Glasgow MVLS ethics committee (reference 200220437 13/09/2023) and LSHTM ethics committee (reference 29853 30/09/2023).

2.4.1. Data analysis

2.4.1.1. Item generation from qualitative work. Building on the topics voted as most important by young people in agenda-setting workshops, and with reference to our six domains and existing frameworks of adolescent wellbeing we identified ten themes relevant to sexual wellbeing. These were: 'feeling you know enough', 'feeling confident and comfortable', 'feeling able to make your own choices', 'feeling safe', 'feeling able to move on', 'knowing who you are and what you like', 'feeling good about your body', 'feeling supported', 'feeling good about yourself', and 'feeling respected'. We conducted thematic analysis of focus group participants' written comments on online whiteboards to identify patterns and recurrent themes in the data (Braun and Clarke, 2006). The comments were mapped against a coding frame built on these ten themes. For example, participant comments such as 'feeling able to make informed choices' and 'knowing where to get contraception' were coded under 'feeling you know enough'. The number of comments corresponding to each code was enumerated to highlight salient concerns. For example, 'feeling able to make your own choices' around sex was expressed in nine different comments by participants.

2.4.1.2. Item reduction via web-based survey. Following data cleaning

Table 1
Survey participants sample characteristics (n = 1710).

Age[a]	**N**	**%**
14-15	310	18.1
16-17	549	32.1
18-19	851	49.7
Gender[b]		
Boy/Man	490	28.7
Girl/Woman	1050	61.4
Non-binary	108	6.3
Prefer to self-describe in some other way	38	2.2
Prefer not to say	24	1.4
Trans identity[c]		
Yes	184	10.8
No	1457	85.2
Unsure	61	3.6
Prefer not to say	8	0.5
Attraction[d]		
Both girls and boys	558	32.6
Boys only	574	33.6
Girls only	421	24.6
I am not attracted to anyone	39	2.3
I prefer not to say	9	0.5
Unsure	109	6.4
Ethnicity[e]		
Asian or Asian British	83	4.9
Black, African, Caribbean or Black British	51	3
Mixed/Multiple ethnic groups	69	4
White or White British	1488	87
Any other ethnic group	19	1.1
Sexual experience[f]		
No sexual experience with another person	477	27.9
Sex (e.g. oral sex, penis-in-vagina sex or anal sex)	782	45.7
Some experiences (e.g. kissing, cuddling, intimate touching) but not sex	417	24.4
Prefer not to say	34	2
Age at first sex[g]		
Not yet had sex	928	54.3
<16	298	17.4
16-17	331	19.4
18-19	149	8.7
Don't know	4	0.2
Future occupation[h]		
At university	1070	62.6
In a steady job	311	18.2
In a training scheme or apprenticeship	202	11.8
At college studying for a trade job	43	2.5
Other, please specify	81	4.7
No response	3	0.2
Own bedroom at home[i]		
Yes	1570	91.8
No	139	8.1
No response	1	0.1
Care experienced[j]		
Yes	108	6.3
No	1576	92.2
Not sure	26	1.5

Survey questions.

[a] What is your age? Answer options: 13 or younger, 14, 15, 16, 17, 18, 19, 20 or older.

[b] *Which option best describes your gender? Answer options: Boy/Man; Girl/Woman; Non-binary or I prefer to self-describe in some other way or I prefer not to say*. Three categories for analysis: Boy/Man; Girl/Woman; Non-binary or I prefer to self-describe in some other way or I prefer not to say.

[c] *Trans describes people whose gender identity is not the same as the sex they were assigned at birth. Do you identify as trans? Answer options: Yes, No, Unsure, I prefer not to say*. Four categories for analysis: cis-girl; cis-boy; trans; all other answers.

[d] Are you attracted to … ? Answer options: Girls, boys, Both girls and boys, I am not attracted to anyone, Unsure, I prefer to self-describe in some other way.

[e] Which of the following best describes your ethnic group or background? Answer options: Asian or Asian British, Black, African, Caribbean or Black British, Mixed/Multiple ethnic groups, White or White British, Any other ethnic group.

[f] Young people vary in their sexual experiences with another person. Which statement below most accurately describes your sexual experience to date? Answer options: No sexual experience with another person, Sex (e.g. oral sex, penis-in-vagina sex or anal sex), Some experiences (e.g. kissing, cuddling, intimate touching) but not sex, Prefer not to say.

[g] How old were you when you had sex (oral, penis-in vagina or anal) for the first time? Answer options: 13 years old or younger, 14 years old, 15 years old, 16 years old, 17 years old, 18 years old, 19 years old, Don't know.

[h] By the time you are 20 years old, do you think you will be: Answer options: At university, In a steady job, In a training scheme or apprenticeship, At college studying for a trade job, Other, please specify.

[i] Do you have a bedroom to yourself at home? (If you have more than one home, answer about the one in which you spend the most time) Answer options: Yes, No.

[j] Have you ever been in care, lived with a foster parent, lived in a residential children's home or lived in a residential setting (e.g. a school or secure unit?) Yes, No, Not sure.

and removal of duplicate responses, descriptive analyses examined item distributions and correlations between items. Given the aim of a *brief* measure, priority was placed on reducing length by identifying weak or uninformative items using the following criteria: 5% non-response; >80% selecting the same answer category; <5% aggregate adjacent endorsement frequencies (where two adjacent response categories have been selected by less than 5% of the sample); or particularly high correlations with other items indicating redundancy (Lamping et al., 2002). Factor analyses further guided item reduction, identifying candidates for deletion based on: presence of cross loadings (items loading on more than one latent factor); low factor loadings (<0.4); and effects on Confirmatory Factor Analysis (CFA) model fit. Although these statistical considerations were used to identify potential items to be dropped, final decisions were based on broader considerations, including coverage (retaining at least one item corresponding to each of the broader domains in the final measure), insights from cognitive interviews on comprehensibility and acceptability, and item reading age.

2.4.1.3. Factor analysis. Following an initial item reduction stage, exploratory factor analysis (EFA) was conducted to examine the latent structure of sexual wellbeing including the number and nature of any potential subscales. CFA then tested and refined the EFA-derived model. Alternative structures were compared, including a second-order model (with a higher order latent factor subsuming first-order factors) and a general specific model (with a global latent factor accounting for item variation) to inform the structure of the final measurement model. Multi-group CFA assessed measurement invariance across age groups (14-16 years; 17-19 years), gender identity, and cisgender status. The final CFA model was extended into a full structural model to estimate associations between sexual wellbeing and external validation criteria (see comparison measures and variables), while adjusting for age, gender identity, and expected occupation at age 20 (see Table 1 for sample characteristics).

Latent variable analyses were conducted using MplusVersion8 (Muthén and Muthén, 2017), applying the WLSMV estimator for ordinal dependent variables (Beauducel and Herzberg, 2006). Missing data were handled via Full Information Maximum Likelihood (FIML) method which is automatically incorporated into structural equation models. Model fit was assessed using the Comparative Fit Index (CFI), Tucker Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) following Yu's established recommendations for interpretation

(Yu, 2002).

3. Results

3.1. Qualitative findings and cognitive interviews

Findings from the agenda-setting workshops linking adolescent sexuality development and mental health are detailed in full elsewhere (Turner et al., 2023). The ten priority topics identified were: self-confidence and self-esteem, body confidence, sexual pressure and expectations, ability to trust partners, confidence in one's sexuality/identity, access to community and support around sex/sexuality, sexual shame, sexual knowledge and experience, impact of early sexual experiences and sexual communication. These formed the basis of 10 scenarios used to guide focus group discussions.

Focus group discussions confirmed the relevance of the priority topics (identified in agenda-setting workshops) to adolescents' experiences and their perceptions of peers' experiences. Three themes were prominent in focus group discussions: feeling able to make your own choices around sex, feeling safe in sexual situations, and feeling you know enough. These aligned well with three of our domains of sexual wellbeing, respectively: agency, safety and support. The other three domains – respect, self-esteem and comfort – were also evident in participant comments.

Thirty-three measure items were generated by the research team to operationalise themes arising from analysis of the focus group transcripts. Iterative rounds of cognitive testing and expert input led to refinements to enhance relevance and comprehension of some items. For example, terms such as 'sexuality', 'partner' or 'sexual preferences' were unfamiliar to some participants and so were avoided. Parentheses were added to two items to ensure clarity (for example, 'I feel confident I could get sexual health support *(e.g., condoms, contraception, testing for sexually transmitted infections)* if I needed it'). Items that explicitly or implicitly assumed prior sexual experience (for example, 'I am able to say what I want in my sex life') were either revised to ensure relevance to inexperienced participants or were removed.

An iterative refinement process reduced the initial pool of 33 items to 23. Eighteen items were revised for clarity, one re-ordered, and two merged, resulting in 22 items being included in the web-based survey (Appendix A).

3.2. Measure development and validation

In total 1710 adolescents completed the web-based survey and provided useable responses (Table 1). A further 1830 questionnaires were screened out following validation checks/cleaning (failed bot or fraud detection checks (n = 179), inconsistent answers on age or region or an IP address from outside UK (n = 359), less than half of questions completed (n = 1211), identified as duplicate (n = 79), nonsensical answers (n = 2).

After initial item analyses, five items were removed for redundancy (Appendix A). The EFA indicated a 3, 4, or 5-factor solution (eigenvalues: 5.07, 1.80, 1.25, 1.21, 1.04). The 3-factor solution generally split items according to whether they were positively or negatively worded for the first two factors, with only one item loading at >0.4 on the third factor. The 4-factor solution was conceptually more convincing, whereas the 5-factor model was similar in structure to the 4-factor solution, but the addition of the 5th factor meant that two of the factors only had two items loading at >0.4. After a full review, the 4-factor solution offered the best conceptual fit, so CFA was conducted on this model. Three additional items were excluded at this stage (Appendix A). The item, "I feel comfortable with who I am attracted to … " was retained despite a lower factor loading due to its conceptual importance for sexual wellbeing, evident from the literature (Camp et al., 2020) and our qualitative work, in which young people described it as an important aspect of feeling comfortable and respected.

Alternative CFA models were compared: a second-order model (a higher-order factor subsuming four first-order factors) and a general-specific model (a global factor explaining all item variance). Although model fit indices were similar (Table 2), the second-order model was considered superior given that all loadings were >0.4 in the expected directions (Table 3) and given its clearer interpretability and alignment with our conceptual framework of sexual wellbeing comprising related subdomains that together form the broader construct. The four first-order factors represented support, comfort/respect, safety/agency, and self-esteem, together reflecting overall sexual wellbeing-with acceptable model fit (RMSEA 0.064; CFI 0.954; TLI 0.941).

Multi-group CFA supported measurement equivalence across age and gender for the first-order factors. For the second-order factor, invariance held across age groups but not fully across gender. Closer inspection found this outcome to be driven by reduced model fit among cisgender boys in particular. The final second-order structure and standardized factor loadings are presented in Table 2.

The four first order factors can be interpreted as follows: factor 1 (3 items) is indicative of perceived level of support from others (formal and informal) on sexual matters. Factor 2 (4 items) relates to the extent of comfort about sexual thoughts and feelings, and whether these feel respected by others; factor 3 (3 items) captures feelings about sexual safety and agency to refuse sex; and factor 4 (3 items) is reflective of self-esteem in relation to sex and intimacy. The single second order factor reflects overall sexual wellbeing, with a higher score indicating higher levels of sexual wellbeing (Table 3).

3.3. External validity

As shown in Table 4, the newly derived Adolescent Sexual Wellbeing Scale (Adol-SW) was negatively associated with depression (Löwe et al., 2005) and anxiety (Spitzer et al., 2006) and positively associated with body image (House of Commons Select Committee, 2020) mental wellbeing (Tennant et al., 2007), and subscales from the Positive Sexuality in Adolescence Scale (Maes et al., 2023), the Sexual and Reproductive Empowerment Scale for Adolescents and Young Adults (Upadhyay et al., 2021), and the Female Adolescent Sexuality Stress and Support (FASSS) Scale (Bedard-Thomas et al., 2019) supporting its construct validity.

4. Discussion

The Adol-SW is the first validated, brief multidimensional measure of adolescent sexual wellbeing designed for use in survey research. The 13-

Table 2
Fit indices of confirmatory factor analysis (CFA) models.

	RMSEA Good fit is ≤ 0.05 Adequate fit >0.05 & < 0.08 Mediocre fit >0.08 & <0.10	CFI Good fit is > 0.95	TLI Good fit is > 0.95
Four factor model	0.061	0.959	0.946
General specific model (4 factors)	0.064	0.960	0.940
Second order model (4 factors)	0.064	0.954	0.941
Multi-group analyses – first order factors			
Age group	0.055	0.954	0.957
Gender identity	0.055	0.946	0.954
Cisgender status	0.057	0.941	0.949
Multi-group analyses - second order factor			
Age group	0.055	0.951	0.957
Gender identity	0.071	0.905	0.924
Cisgender status	0.077	0.885	0.908

Table 3
Final second order CFA model and standardized factor loadings.

Factor concept	Item wording	First order factor loading	Second order factor loading
Support	I feel confident I could get sexual health support (e.g. condoms, contraception, testing for sexually transmitted infections) if I needed it.	0.545	0.510
	I have someone that I can talk with openly about sex and relationships.	0.799	
	If I were to have a bad sexual experience, I have someone I can talk to.	0.787	
Comfort and Respect	Thinking about sex makes me feel ashamed.	0.704	−0.907
	The idea of having sex makes me feel anxious.	0.778	
	I feel left out when people talk about sex.	0.576	
	I feel comfortable with who I am attracted to (e.g. boys, girls, both, no one)[a].	−0.471	
Safety and Agency	I'm anxious that someone might try to touch me in sexual ways I don't want.	0.717	−0.663
	I feel pressure to do things sexually that I don't want to.	0.728	
	I worry that if someone asked me out, they would only want sex.	0.683	
Self-Esteem	I worry about being bad at sex.	0.623	−0.745
	Most days I feel attractive.	−0.505	
	I feel anxious about what others will think of my naked body.	0.820	

Answer options: strongly agree; agree; neither agree nor disagree; disagree; strongly disagree. Fit indices: RMSEA: 0.064; CFI: 0.954; TLI: 0.941.

[a] In the original measure, we used the term 'both' genders. We recommend future users of the measure use the term 'any' instead of 'both', as it is more inclusive.

Table 4
Associations between Adol-SW score and external variables.

External variable	Coefficient	Standard error	p-value
Depression (PHQ-2	−0.378	0.032	<0.001
Anxiety (GAD-7)	−0.337	0.033	<0.001
Body image	0.763	0.023	<0.001
Mental wellbeing (WEMWBS)	0.462	0.023	<0.001
Positive Sexuality in Adolescence Scale (PSAS) – Factor 3 Control over sexual experiences	0.571	0.020	<0.001
Positive Sexuality in Adolescence Scale (PSAS) – Factor 5 Acceptance of one's own sexuality	0.528	0.020	<0.001
Sexual And Reproductive Empowerment Scale for Adolescents and Young Adults – Self-love subscale	0.586	0.020	<0.001
The Female Adolescent Sexuality Stress and Support (FASSS) Scale – Friend support subscale	0.521	0.021	<0.001

Binary variables – probit: depression (1 = depression); anxiety (1 = anxiety); body image (1 = positive or very positive). All other variables are continuous – standardized coefficients permitting comparison.

item scale captures cognitive and affective dimensions of adolescent sexuality development. It is suitable for adolescents aged 14-19 regardless of sexual or relationship experience. The four-factor structure (support, comfort/respect, safety/agency, and self-esteem) reflects aspects of sexual wellbeing important to adolescents. Based on their relatively higher factor loadings, comfort with sexuality and sexual self-esteem emerged as particularly salient dimensions of overall wellbeing, consistent with our qualitative development work in which young people prioritised feeling confident and in control of one's choices when navigating sex and relationships during adolescence. The scale demonstrates robust internal structure and good model fit across age and gender subgroups.

The measure's associations with external constructs further supports its validity. As hypothesised, higher sexual wellbeing was associated with greater overall wellbeing, body confidence, and sexual empowerment, and lower levels of anxiety and depression. These findings align with evidence from adolescents that links body satisfaction and sexual satisfaction (Kvalem et al., 2019), and that links good sexual health with lower level of depression (Hensel et al., 2016). The association between sexual wellbeing and depression/anxiety confirms that these issues matter to adolescent psychological wellbeing and suggests that working to support positive sexual development in adolescence could have significant wider benefit to mental health (and vice versa).

The Adol-SW is founded on a similar framework of sexual wellbeing to the Natsal-SW for adults, previously developed by our research team (Lewis et al., 2025; Mitchell et al., 2023). Both could be used for older adolescents (16 to 19). Due to their shared conceptual foundation, themes are similar across measures and several items are alike (e.g. having someone to talk to, comfort with sexuality, only doing sexual activities you want to do). The Adol-SW has more emphasis on cognitions and emotions relevant to the developmental period (e.g. feeling left out when others talk about sex) and is much more appropriate for adolescents with little or no sexual experience.

4.1. Strengths and limitations

A key strength of this study is its rigorous multi-stage development approach and extensive youth engagement. Meaningful involvement of young people in measure development is surprisingly rare. Young people were involved at every stage – from conceptualisation and item development to cognitive testing and interpretation – to ensure relevance in terms of priorities, experiences and language and maximise face validity. Language choice and decisions on phrasing were carefully considered given a need to ensure acceptability to gatekeepers (e.g., ethics boards, parents, schools) as well as acceptability to adolescents. The use of iterative rounds of cognitive testing (as opposed to a single round) brought to light issues with comprehension that we were subsequently able to refine and retest.

Limitations included that negatively framed items tended to perform better psychometrically than positive items, leading to inclusion of seven negatively framed items. This also partly reflected the strong presence of concerns and anxieties about pain, pressure, and inexperience around sex in development work, especially among adolescent girls. This is primarily a face validity issue since reverse scoring on negative items means that all items indicate the level of wellbeing for that dimension (e.g. extent of perceived inclusion, extent of freedom from pressure or shame). In this respect, our measure aligns with mental health measures such as the GHQ-12 (Griffith and Jones, 2019) which mix positively and negatively worded items, rather than fully positively worded wellbeing measures such as WEMWBS (Tennant et al., 2007). Secondly, partial invariance across gender groups indicates that the scale is best suited for within-group analyses and means score comparisons across genders should be treated as exploratory unless further evidence of invariance is established. This finding may reflect difficulty we faced recruiting a representative group of cisgender boys using social media or it may suggest that overall sexual wellbeing is experienced differently by cisgender boys and girls. The small size of ethnic minority sub-groups meant that we were unable to test for measurement invariance across ethnic groups. As the measure was developed and validated on a UK population, testing its validity in other cultural or social contexts with differing norms around sex and sexuality is still needed. Cross-cultural validation is required to ascertain the measure's applicability in other settings, particularly in low-and middle-income countries

where research on adolescent sexuality is more limited. Finally, future studies should appraise the temporal stability of the measure by assessing its test-retest performance.

4.2. Implications for research, policy and practice

The Adol-SW, has a range of potential applications in research, policy, education and practice in the field of mental health. Its inclusion in major adolescent surveys would permit systematic monitoring of sexual wellbeing as a core dimension of adolescent health and wellbeing. In addition, the Adol-SW could be used as an outcome measure in intervention evaluation, pending confirmation of sensitivity to assess change in sexual wellbeing over time. It should facilitate research to improve understanding of the links between adolescent sexual development and mental health and wellbeing, including how intersecting socio-demographic characteristics shape these links. It supports more comprehensive exploration of the role of sexual concerns in adolescent mental health, body image, social media use, and relational dynamics. As a tool in education, it could help demonstrate the diversity of wellbeing responses among young people, helping promote holistically framed sex education and laying foundations for future sexual experiences that contribute positively to mental health and wellbeing.

5. Conclusion

The 13-item Adol-SW is a brief, validated, multidimensional measure of adolescent sexual wellbeing suitable for population surveys. As a new assessment tool, it represents a significant step toward reframing sexuality as an integral part of adolescents' overall wellbeing. Embedding the Adol-SW in future health surveys will generate much-needed evidence on the links between sexual development, mental health and wellbeing, enabling future policy and service developments that reflect young people's needs and priorities.

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CRediT authorship contribution statement

Billie Turner: Data curation, Investigation, Project administration, Visualization, Writing – original draft, Writing – review & editing. **Melissa Palmer:** Formal analysis, Funding acquisition, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing. **Raquel Bosó Pérez:** Data curation, Investigation, Project administration, Visualization, Writing – review & editing. **Ruth Lewis:** Conceptualization, Funding acquisition, Investigation, Supervision, Visualization, Writing – original draft, Writing – review & editing. **Lucia F. O'Sullivan:** Conceptualization, Funding acquisition, Investigation, Methodology, Supervision, Writing – review & editing. **Sally McManus:** Conceptualization, Funding acquisition, Investigation, Methodology, Supervision, Writing – review & editing. **Chris Bonell:** Conceptualization, Funding acquisition, Investigation, Methodology, Supervision, Writing – review & editing. **Elizabeth McDermott:** Conceptualization, Funding acquisition, Investigation, Methodology, Supervision, Writing – review & editing. **Kirstin R. Mitchell:** Conceptualization, Funding acquisition, Investigation, Methodology, Supervision, Validation, Writing – original draft, Writing – review & editing.

Declaration of competing interest

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Appendix A. Supplementary data

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