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Systematic Review

Adolescent sexual behaviour: A systematic review of psychological assessment tools

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Abstract

Background

Sexual behaviour in adolescents has been explained as a multi-systemic and multi-dimensional concept. While most research perceives adolescent sexual activity as risky behaviour, a significant case has also been made to understand these activities as a healthy normative process.In contemporary literature, a significant increase in adolescent sexual behaviourhas been noted, further emphasizing the need to assess this behaviour more comprehensively.

Methodology

This systematic review identifies assessment tools for adolescent sexual behaviour and evaluates their psychometric properties as well as clinical utility. Relevant publications in English or Hindi from 1990 to 2022 were identified using a comprehensive search strategy in PubMed and ScienceDirect, supplemented by screening citations and references. Furthermore, a 10-point quality judgment criterion was used to evaluate the psychometric aspects of the scales.

Results

Eleven publications were identified and selected for this review, of which ten were self-report measures, and one was an interview-based instrument. Findings indicated that most tools showed only moderate psychometric qualities and had limited clinical utility.

Conclusion

Assessment tools to test sexual behaviour in adolescents have been more focused on risky behaviour, and more diverse and psychometrically sound tools with more robust validation studies are required to study this important area better.

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Introduction

Adolescence is commonly seen as a transitional developmental phase during which individuals beginto consolidate their identities and prepare for living independently by creating personal competence and peer and intimate relations. Viewed from an Eriksonian perspective (Orenstein & Lewis, 2022), this age group between 10 to 19 years (World Health Organisation, 2022) precedes the resolution of intimacy vs. isolation, which, consequently, makes it particularly important from the perspective of sexual behaviour as well.

Sexual behaviour in humans is a broad concept encompassing physical practices, desires, attitudes, experiences, and preferences for sexual behaviour (American Psychological Association, 2022). There is a significant effect of psycho-social attributes on this behaviour as well. More importantly, it is not limited to conception but also includes various processes or actions related to pleasurable sexual satisfaction, for example, masturbation, oral sex practices, etc. Sexual behaviour in adolescents is an even more complex concept influenced by developmental processes across various domains (Sessa, 2016). An adolescent's movement toward a first sexual experience is influenced by myriad factors presented as a Multi-Systemic view (Chen et al., 2010) which include but are not limited to biological sexual maturation, environmental opportunities for engaging in sexual intimacies, sense of self, and self-efficacy,parent and peer values associated with sexual behaviours, and capacity for cognitive reasoning. Further, the socio historical changes of the 21st century have changed the concept of sexual behaviour for adolescents in many ways by including practices such as 'outer course' (non-penetrative sexual behaviours), cyberdating, sexting, etc. (Sessa, 2016). Further, high exposure to sexual content in various media has been associated with cognitive factors such as peer sexual behaviour, expectations about sex, and permissive attitudes about sex in adolescents (Bleakly et al., 2011).

In literature, adolescent sexual activity has been primarily discussed as a developmental risk factor linked to negative health and adjustment outcomes (Vrangalove & Savin-Williams, 2011). It is understood that adolescents are usually poorly informed about how to protect themselves from negative sexual outcomes, which makes them particularly susceptible to unwanted pregnancies, STDs, and even sexual abuse (Laksmi et al., 2007). Hence, adolescent sexual behaviour becomes closely related to health behaviours, which according to the Integrated Model, include intention, social norms,a bsence of environmental constraints, necessary skills, positive attitude, consistency with self-image, positive emotional reactions, and confidence in performing the behaviour (Buhi & Goodson, 2007).

At the sametime, contemporarily, sexual curiosity and exploration have also been recognized as normative and healthy processes during adolescence (Vrangalove & Savin-Williams, 2011). These could, therefore, be developmental assets and could be related to well-being, facilitating teenagers' psychosocial adjustment.

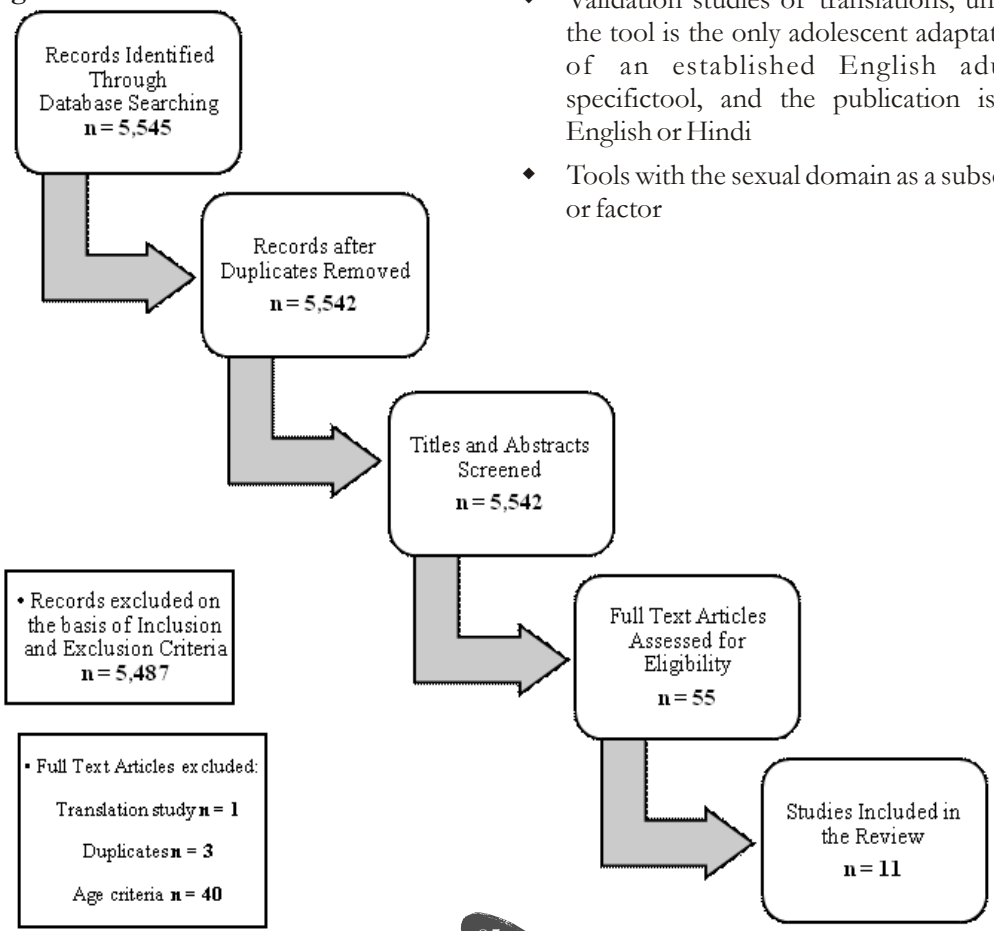
Irrespective of the positive or negative connotation attached to adolescent sexual behaviour, the increase in sexual activity in adolescents (Laksmi et al., 2007) makes it pertinent to assess this behaviour more robustly. Furthermore, given the multi-systemic and multi-dimensional understanding of sexual behaviour in adolescence, it becomes even more important to assess all these various domains to generate a comprehensive understanding. Hence, this study aims to systematically review the psychometric properties of the psychological assessment tools developed to evaluate adolescent sexual behaviour.

Methodology

Study selection

Following PRISMA guidelines, a computer database search of PubMed and Science Direct was conducted for publications between 1990 to 2022, using the following search terms developed based on the domains mentioned in the APA definition of 'Sexual Behaviour': Adolescent, Sexual; Behaviour; Experience; Desire; Attitude; Preference; Porn; Masturbation; Assess; Test; Measure. In addition, citations and references in selected journal articles were also screened. Both authors performed searches independently to limit the risk of bias on 31st July 2022, 17th August 2022, and 28th August 2022.

Figure 1. Search strategy : PRISMA flow diagram



The following inclusion criteria were used to screen relevant publications:

- Publications on validation of assessment instrument/scale adolescent (age: 10-19 years) sexual behaviour, including self-report, behavioural, or interview-based tools.
- Publications in English or Hindi

Further, the following publications were excluded:

- Tools for ages 18 years and above or 12 years and below. Despite the overlap in age ranges, it was decided to exclude these tools as they would not specifically assess complex processes in adolescents. However, tools assessing both adolescents and young adults were included.
- Validation studies of translations, unless the tool is the only adolescent adaptation of an established English adult-specifictool, and the publication is in English or Hindi
- Tools with the sexual domain as a subscale or factor

Our search generated a large number of publications (Figure 1). In the first stage, we screened the title and abstracts to determine the publications' inclusion, which yielded 59 studies. This was followed by screening full-length articles, post which we identified 10 publications suitable for the review.

We used Streiner & Norman's (2015) requirements for health measurement scales for data abstraction and evaluation of assessment scales (Table 1). Abstraction and evaluation were primarily done by the first author. However, to check for reliability and quality, a small part of the data abstraction process (N = 4) was conducted by both reviewers, where the overall agreement was found to be 90%. Identified characteristics of each study were discussed and systematically entered into Microsoft Excel© 2019.

Adolescent Sexual Interest Card Sort given by Hunter et al., (1995) is a 64-item self-report measure that consists of a series of sexual vignettes to rate on a 5-point scale indicating whether the adolescent is aroused by thoughts of engaging in that behavior. The vignettes are further divided into 17 content-related categories like consensual sex with Aggressive sex/ Violence only/ Consensual Sex with Adult female/ Own Age/ Young Female as well as Frottage, Voyeurism, Exhibitionism, and some Filler Items. The overall homogeneity of the scale was good (α = .97). The authors also estimated concurrent Validity using Phallometric Assessment in juvenile offenders. However, the Validity could not be established significantly.

Adolescent and Young Adult Condom Self-Efficacy Scale given by Hanna in 1999 was developed on the theoretical construct of self-efficacy given by Bandura for individuals between 13 to 26 years of age. It is a 14-item self-report measure scored on a 5-point Likert scale (1 = very unsure, 5 = very sure). The construction of items was kept inclusive for all sexualities and ethnicities and was done through a literature review, validity estimation by independent reviewers, and item analysis through item-total correlations. Further, factor analysis showed three self-efficacy factors with good internal consistency - communication abilities related to condom use (α= .77), consistent condom use abilities (α = .72), and correct condom use abilities (α = .78). The overall scale also showed good reliability (α = .85). In addition, the construct validity was established by significant difference ($p < 0.05$) observed between regular and irregular condom users. However, no standardized tool was used to assess this parameter. The validation study was not very robust, and further studies would be required to establish better psychometric properties for this scale.

Sexual Risk Behavior Beliefs and Self-efficacy (SRBBS) scales by Basen-Engquist et al., (1999) is a comprehensive self-report scale developed to assess sexual behaviour and condom use with 22 items scored on a 3 or 4-point Likert scale. A large sample [N = 6213] of adolescents aged 14 to 18 years was recruited for the study. Items for the scale were developed and tested through focus group discussions and further study of construct validity (factorial validity) was carried out using Confirmatory Factor Analysis with the following indices - Chi-square ($P > .15$), RMSEA < .08, Standardised Residuals around 2.58 & Normal distribution of Residuals. This indicated that the model fit the data very well. The factor analysis delineated 8 factors with good internal consistency - Norms about Sexual Intercourse (α =.78), Attitudes about Sexual Intercourse (α = .78), Self-Efficacy in Refusing Sex (α=.70), Norms about Condom Use (α=.84), Attitude about Condom Use (α=.87), Self-Efficacy in Communication (α=.66), Self-Efficacy in Using Condoms (α=.61), and Barriers to Condom Use (α=.73). The study also provided concurrent validity of

Table 1. Abstraction and evaluation criteria

Domains	Score = 2	Score = 1	Score = 0
Origin of Items	Generated specifically for adolescents	Adapted or modified foradolescents	Originated from a scale developed for another population
Number of Participants	N => 100	50 < N < 100	N < 50
Content Validity	Covers all important dimensions (in the reviewers' opinion)*	Covers important dimensions to a moderate extent (in the reviewers' opinion)*	Does not cover important dimensions (in the reviewers' opinion)*
Criterion Validity	High correlates with standardised measure (r > .60)	Moderate correlates with standardised measure (.40 < r < .60) or high correlates with unstandardised measure (r > .60)	Low correlates (r<.40)
Construct Validity (Convergent)	High correlates (r > .60)	Moderate correlates (.40 < r < .60)	Low correlates (r < .40)
Construct Validity (Divergent)	High correlates (r > .60)	Moderate correlates (.40 < r < .60)	Low correlates (r < .40)
Homogeneity	.70 < α < .90	α > .90 or.60<α<.70	α< .60
Inter-rater Reliability	reliability coefficient >.80	.60 < reliability coefficient < .80	reliability coefficient < .60
Test-retest Reliability	reliability coefficient >.80	.60 < reliability coefficient < .80	reliability coefficient < .60
Feasibility	Short scale with instructions and norms	Short scale with some instructions	Complex/ long scale
*Dimensions assessed by the reviewers included: Validity and comprehensiveness of the definition of the construct, clarity of the instructions, grammar and syntax of the items, representativeness of the item pool, and the adequacy of the response format			

Assessment Tool [Author]	Dimensions & Scoring	Origin of Items	Sample	Content Validity	Criterion Validity	Construct Validity	Construct Validity Divergent	Homogeneity	Inter-Rater Reliability	Test-Retest Reliability	Feasibility	Overall Score
Adolescent Sexual Interest Card Sort [Hunter et al., (1995)]	13-19 years 64 items 17 factors 5-point Likert Scale	Adolescent specific; Males	N = 38	Covers major domains; Male specific	Phallometric Assessment	-	-	α = 0.97	-	-	Long and some instructions provided	6
		2	0	1	0	-	-	2	0	-	1	
Adolescent and Young Adult Condom Self-Efficacy Scale [Hanna (1999)]	13-26 years 14 items 3 subscales 5-point Likert scale	Adolescent specific	N = 209	Covers all domains	-	Difference between regular and irregular condom users	-	α = 0.80	1	-	Short and some instructions provided	11
		2	2	2	0	1	0	2	1	0	1	
Sexual Risk Behavior Beliefs and Self-efficacy (SRBBS) [Basen-Engquist K. et al., (1999)]	14-18 years 22 items 8 subscales 3/4-point Likert scale	Adolescent specific	N = 6213	Covers all domains	Multivariate analysis for difference: Sexual experienced, Sexual activity in the last 3 months & Condom Use Consistency	Factorial Validity using CFA	-	α = .81 - .87	-	-	Short, some instructions provided, and norms given	13
		2	2	2	1	2		2	-	-	2	
Adolescent Clinical Sexual Behavior Inventory [Friedrich et al.,	12-19 years 27 items 3 subscales 3-point	For adolescents	N = 141	From clinical perspective more domains could be covered	-	Convergent Validity with CBCL and SCL	-	α = .78	-	-	Short and instructions provided. Norms not given.	10

Table 2. Continued.....

Romantic Competence Interview (RCI) [Davila et al., (2007)]	**11-19 years** **Semi-Structured Interview** **5-Point Likert Scale**	**Adolescent-specific questions, theory-based**	**N = 83;** **Females**	**All domains covered**	**Concurrent & Predictive Validity**	**Significant association with ICQ, MAHC & AAS-R**	**No significant association with IPPA**	**n**	**Intra-class correlation = .61 &** **α = .80**	**-**	**Short, Instructions given**	13
		2	2	2	1	2	1		2	-	1	
Adolescent Sexual and Reproductive Health Stigma Scale (SRH Stigma Scale) [Hall et al., 2018]	15-24 years 20 items 3 subscales 3-point Likert scale	Adolescent specific	N = 1080 women	All domains covered	-	Factorial Validity through CFA & Convergent Validity using estimate of Contraceptive Use	-	α = 0.74	-	-	Short, Interpretable and Instructions given	11
		2	1	2	0	2	0	2	0	0	2	
Condom Use Barriers Scale for Adolescents (CUBS-A) [Escribano et al., (2017)]	13-18 years 15 items 4 factors 3-point Likert Scale	Adolescent Specific	N = 629	All domains covered	Difference in Percentage of Condom Use	Factorial Validity using CFA	-	α = .63- .81	-	-	Short, Instructions given	12
		2	2	2	1	2	0	2	0	0	1	
Scale of Myths about Sexuality [Guerra et al., (2018)]	10-19 years 27 items 6 domains 5-point Likert scale	Adolescent Specific	N = 216 + 661	All domains covered	-	-	-	α = .865	-	-	Short, Instructions given	9
		2	2	2	0	0	0	2	0	0	1	

Table 2. Continued.....

Sexual Sensation Seeking Scale (SSSS) [Ballester-Arnal et al., (2018)]	**15-18 years** **11 items** **2 factors** **4-point Likert scale**	**Adapted from Sexual Sensation Seeking Scale developed for Adults**	**N = 1328;** **Cis-gender** **Heterosexual** **Bias**	**Major domains covered, but not all adolescent relevant**	-	**Convergent Validity - Significant association with Sexual Compulsivity Scale & Survey on Sexual Habits and Attitudes**	**Divergent Validity - No significant association with IPPA**	**α = .82**	-	-	**Short, Norms and Instructions Mentioned**	12
		1	2	2	0	2	1	2	0	0	2	
Sexual and Reproductive Empowerment Scale [Upadhyay et al, (2020)]	15–24 years 23 items	Adolescent Specific, robust generation	N = 3,597	All domains covered	-	Association between subscales and sample characteristics	-	α = .880	-	-	Short, Norms and Instructions given	9
		2	2	2	0	1	0	2	0	0	2	
Problematic Pornography Consumption Scale (PPCS-6-A) [Böthe B. et al. in 2021]	M(Age) = 15.41 years 6 items 6 components 7-point Likert scale	Adapted for Adolescent Population	N = 802	Theoretically relevant items	-	Factorial Validity using CFA Convergent Validity through Sexual Desire Inventory-2, frequency of pornography use and frequency of pornography use	-	α = .80, CR = .90	-	-	Short, Interpretable and Instructions Mentioned	11
		1	2	2	0	2	0	2	0	0	2	

the scale through multi variate analyses that indicated the scale's ability to differentiate between individuals who were sexually experienced and those who were not, who were sexually active in last 3 months and those who were not, as well as between consistent and inconsistent condom users. However, these analyses were done based on arbitrary questions, and structured tools were not employed, reducing the analyses' reliability.

Adolescent Clinical Sexual Behavior Inventory given by Friedrich et al., in 2004 is a 27 item self-report measure scored on a 3-point Likert scale (0 = not true and 2 = very true). It assesses a broad range of sexual behaviour and attitude, which have been seen as 3 factors/subscales-Concerns About Appearance ($\alpha = .75$), Sexual Interest ($\alpha = .63$), and Sexual Risk/Misuse ($\alpha = .61$). Principal Component Analysis done by Wherry et al., (2009) estimates its homogeneity at $\alpha = .78$, which is good. Further, convergent Validity showed significant moderate correlations with the Child Behaviour Checklist ($r = .23 - .33$, $p < .05$) and Symptoms Checklist ($r = .27 - .50$, $p < .05$). This indicates the scale's possible utility for the clinical setting. However, further analysis for criterion validity needs to be done to establish the clinical value.

Romantic Competence Interview (RCI) by Davila et al., (2007) is a semi-structured interview that assesses romantic competence in adolescent females (M = 13.5 years) on a five-point scale (5=significant level of competence, 1 = no evidence of competence), with 0.5-point scores allowed. The length of the interview ranges from 20 to 40 mins. It has a strong theoretical basis for the questions that include, but are not limited to, attitudes towards romantic interests, behaviour and decision-making, sources of information, normative experiences and attitudes, and romantic experiences, including physical relationships. The questions are appropriate for adolescents, and the interview coding showed adequate inter-rater reliability with .61 intra-class correlation and $\alpha = .80$. The authors established convergent and discriminant Validity of the interview by analysing and accepting the a-piori hypothesis that RCI will be significant but weakly associated with Interpersonal Competence Questionnaire (ICQ) [r = .20 - .24], Measure of Adolescent Heterosocial Competence (MAHC) [$r = .23$, $p < .05$] and Revised Adult Attachment Scale (AAS-R) [$r = -.19 - .31$, $p < .05$], and will not be significantly correlated with peer security (IPPA). Further, concurrent and predictive Validity was also established through hypothesis testing and administering tests at two points in time one year apart. However, the criteria established (perception of marriage and sexual activity) were not standardized and structured, albeit theoretically sound.

Adolescent Sexual and Reproductive Health Stigma Scale (SRH Stigma Scale) by Hall et al., 2018 is a self-report 3-point Likert scale measure with 20 items developed primarily for female adolescents between 15 to 24 years of age. The conceptualisation of the scale was robust. Items were generated through themes and codes elicited during interviews with 63 women. Further analysis of items was done by researchers independently. However, inter-rater reliability was not mentioned. Confirmatory factor analysis (CFA) was employed to estimate the scale's construct validity, and it showed a good fit of the model to the data based on the following indices - chi-square $p < 0.001$; RMSEA = 0.074; SRMR = 0.065. Three subscales were delineated in the CFA - internalized stigma, enacted stigma, and stigmatizing lay attitudes. In addition, good internal consistency was found for the overall scale ($\alpha = 0.74$) and between-subscale correlations ($\alpha = 0.82$ to 0.93). Further, the study estimated the convergent Validity of the scale concerning contraceptive use, and the authors posited a

possible quantification of reduction in the odds of contraceptive use at 3% with every 1-point increase in SRH stigma scores. However, this estimation was done based on a subjective arbitrary report of contraceptive use and not a standardised scale.

Condom Use Barriers Scale for Adolescents (CUBS-A) by Escribano et al., (2017) was developed for adolescents between 13 to 18 years of age. The study sample included 629 Spanish adolescents. It is a 15-item scale with three response option scales (disagree = 1; neither agree nor disagree = 2; agree = 3). Scale construction was carried out in three phases - an item proposal by 4 independent experts, a pilot study (n = 10), and analysis of psychometric properties. The authors used Exploratory Factor Analysis (EFA) and CFA to establish construct Validity. Four factors were found through EFA with moderate to high internal consistency - Negotiation skills (α=.73), Perceived feelings (α=.81), Negative aspects of condoms α = .63) and Disruption of the sexual experience (α = .78). Further, the model was validated through CFA indices - NNFI = .93; CFI = .95; IFI = .95; and RMSEA = .04. Concurrent validity was also established through difference in percentage of condom use, however, although theoretically relevant, this was an arbitrary non-standardised construct.

Scale of Myths about Sexuality by Guerra et al., (2018) was developed for individuals between 10-19 years of age. It is a 27-item scale with 6 components - Intolerance, Romantic love, Sexist Myths, Generational Myths, Contraception, and Pregnancy - which were scored on a 5-point Likert-type scale (1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree). The scale construction was done through two samples - pilot [N = 216] and final [N = 661]. Items were developed through a brainstorming session and subsequent independent analysis by 23 experts. During the pilot study, item analysis was done using item-total correlation, and the original 69 items were reduced to 27 items. During the final analysis, the scale showed good internal consistency (α = .865). The study did not assess many domains of psychometric properties and would require further analysis.

Sensation Seeking Scale (SSSS) by Ballester-Arnal et al., (2018) is an adaptation of the scale originally given by Kalichman & Rompa in 1995. It is an 11-item self-report measure for adolescents between 15-18 years of age that rates answers on a Likert scale from 1 (not at all like me) to 4 (very much like me). This particular adaptation was made on a large sample [N = 1328] of Spanish adolescents recruited via accidental sampling for the study. The procedure for translating items into Spanish was explained, and a quantitative estimate of the consensus among the translators was also reported (>85%). In contrast to Kalichman & Rompa's unidimensional proposal, two factors-Physical Sensations Attraction (PSA) and New Experiences Seeking (NES) - were found to be a better fit through Exploratory Factor Analysis with weighted least squares and direct oblimin rotation and Confirmatory Factor Analysis by Structural Equation Modeling. The scale showed good internal consistency with Cronbach α (Total scale) = 0.82, and the two factors α (PSA) = 0.76 and α (NES) = 0.82. In addition, significant moderate correlations of sexual sensation seeking with the Sexual Compulsivity Scale [r(Men) = 0.497 & r(Women) = 0.651; $p < 0.001$], and low correlations with a Survey on Sexual Habits and Attitudes assessing the Number of Partners [r(Men) = 0.278 & r(Women) = 0.349; $p < .001$] and Alcohol or Other Drugs Consumption [r(Men) = 0.288 & r(Women) = 0.345; $p < .001$] indicated towards adequate convergent and divergent validity. Moreover, the study also presented acceptable norms with mean scores for men and women, where men scored significantly higher than women.

However, no estimates for construct validity and test-retest reliability were calculated, and the study showed a heterosexual cis-gender bias by lack of inclusion of other genders and sexuality, which is a particularly significant drawback when creating an assessment for sexual behaviours.

Sexual and Reproductive Empowerment Scale developed by Upadhyay et al, (2020) assesses empowerment in the context of Bronfenbrenner's Ecological Model in adolescents and young adults between 15 to 24 years of age. It was developed through six stages. The first three stages focused on the formulation of items by understanding the power dynamics through interviews : formative qualitative research (stage-1), generating domains and item pool using inductive and deductive methods through literature review and group sessions with experts (stage 2), and assessing the clarity of the items through the cognitive interview (stage 3). Hence, considerable focus was given to the origin of items. During the fourth stage, baseline assessment and follow-up administration were done. In the next stage, Exploratory Factor Analysis was carried out, which delineated 7 sub scales - Comfort talking with a partner, Choice of partners, marriage, and children, Parental support, Sexual safety, Self-love, and Sense of future- which showed $\alpha > 0.7$. Further, good homogeneity was observed on the total scale with $\alpha = 0.88$. Moreover, to assess the construct validity, associations of sub scales with sample characteristics were estimated that showed expected directions. However, no standardised tools were used to validate the scale further, indicating the need for future validation studies.

Problematic Pornography Consumption Scale (PPCS-6-A) given by Bothe et al. in 2021 is an adaptation of the PPSC for adolescents. It is a self-report unidimensional scale developed following Griffith's six-component model for addiction rated on a 7-point Likert scale (1 = never; 7 = all the time). An adequately diverse (in sexual orientation and gender identity) sample of 802 adolescents was taken for the validation study. The structural Validity of the scale was established through Confirmatory Factor Analysis where an adequate fit was found (CFI = .982, TLI = .969, RMSEA = .088 [90%CI .069-.109]), and it also estimated good internal consistency ($\alpha = .80$; CR = .90). In addition, convergent Validity was well established based on significant moderate associations with the frequency of pornography use ($r = .48$, $p < .001$) and the frequency of masturbation ($r = .33$, $p < .001$), and low correlations with sexual thoughts ($r = .23$, $p < .001$), sexual arousal ($r = .20$, $p < .001$) and sexual drive ($r = .22$, $p < .001$) which were evaluated using an adapted version of Sexual Desire Inventory-2. In addition, profiles for low-risk and at-risk problematic pornography users were created through latent class analyses.

Discussion

Our systematic review identified 11 studies on assessment tools to test sexual behaviour in adolescents through PubMed and Science Direct. As observed during our search (see Figure 1), very few tools are available for the adolescent population, and the majority of the tools have been developed for adults 18 years and above. Moreover, none of the tools included specific behaviours concerning LGBTQIA++, which creates a further lacuna in assessing sexual behaviour. Given the significant increase in sexual behaviour in adolescents in the present socio-cultural context, it becomes pertinent to create more standardised assessment measures.

As discussed in the earlier sections, adolescent sexual behaviour has historically been associated with negative connotations in research and is primarily seen as risky behaviour. The assessment tools also follow the same trend as 8 out of the 11 tools largely focus on risky and safe behaviours. Only the

RCI (Davila et al., 2007), Sexual and Reproductive Empowerment Scale (Upadhyay et al., 2020), and 2 subscales of Adolescent Clinical Sexual Behavior Inventory (Friedrich et al., 2004; Wherry et al., 2009) aimed to measure the other attitudes and beliefs related to sex that impact one's sexual behaviour. Therefore, there is the paucityof assessment tools to test the positive aspects of adolescent sexual behaviour.

The evaluation of psychometric properties of the identified assessment tools indicates that most of the tools only have a moderate level (score $\leq$ 13) of quality and require more validation studies. The Adolescent Sexual Interest Card Sort (Hunter et al., 1995), Adolescent and Young Adult Condom Self-Efficacy Scale (Hanna, 1999), and Adolescent Clinical Sexual Behavior Inventory (Wherry et al., 2009) showed particularly less robust analysis and low validity. Although Sexual and Reproductive Empowerment Scale received a low score, the item construction was very detailed and systematic, and its factors were relevant, indicating that further studies on the scale could yield promising results. SRBBS (Basen-Engquist et al., 1999), CUBS-A (Escribano et al., 2017), and SSSS (Ballester-Arnal et al., 2018) had the highest score for psychometric properties with robust analysis. However, added reliability and validation studies might be needed for parameters that were not analysed, such as test-retest reliability, etc. The RCI (Davila et al., 2007) was the only qualitative tool identified, and its validation study was sound, indicating the possible utility of the tool to assess multiple domains more comprehensively. Most importantly, none of the tools had an adequate analysis of criterion validity and were also not studied on any clinical sample, due to which their clinical utility cannot be established.

Conclusion

Therefore, it can be concluded that assessment tools to test sexual behaviour in adolescents have been more focused on risky behaviour, and more diverse and psychometrically sound tools with more robust validation studies are required to study this important area better. Further research would be required to develop more robust tools to study healthy adolescent sexual behaviour as well as particular sexual behaviours of the LGBTQIA++.

Limitations

This study had some limitations. Although, according to the AMSTAR guidelines, at least two databases have to be searched to have a Systematic Review (Tawfik et al., 2019), the study would have been much more comprehensive if more search engines were used to identify relevant publications. Furthermore, registration of the protocol on PROSPERO would have reduced the risk of bias even more. We were also unable to calculate the inter-rater reliability for evaluating all of the studies, which would have given a better estimate of the risk of bias.

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