

Multicomponent Model of Harmful Sexual Behaviour in Autism with co Morbid Intellectual Disability

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Abstract

This study aimed to develop and empirically validate a multicomponent model explaining harmful sexual behaviour (HSB) in individuals with autism spectrum disorder (ASD) and comorbid intellectual disability (ID), integrating neurodevelopmental, psychological, social, environmental, and systemic factors. A mixed-method model-development design was implemented across three phases: systematic literature synthesis, empirical component mapping, and expert validation using a modified Delphi approach. A sample of 124 individuals with ASD and ID was assessed using standardized measures of cognitive functioning, adaptive behaviour, emotional regulation, trauma exposure, and social cognition. Structural equation modeling (SEM) and hierarchical regression were applied to test direct and indirect relationships that lead to the severity of HSB. Emotional dysregulation became a factor which has the most significant predictor of the severity of HSB ($r = 0.63$, $p < 0.001$; $\beta = 0.47$, $p < 0.001$). The regression model was able to explain 54% of the variance (Adjusted $R^2 = 0.54$), where the SEM explained 62% with a satisfactory model fit (CFI = 0.93; RMSEA = 0.067). Neurodevelopmental vulnerability exerted both direct and indirect effects through social cognition deficits, and trauma exposure significantly moderated behavioural expression ($\beta = 0.29$, $p < 0.05$). Harmful sexual behaviour in ASD with ID is best understood through a dynamic, interaction-based framework. Targeting emotional regulation, trauma-informed care, and social cognition may enhance prevention and intervention strategies.

Keywords Autism Spectrum Disorder, Emotional Dysregulation, Harmful Sexual Behaviour, Intellectual Disability, Multicomponent Model.

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Introduction

Harmful sexual behaviour (HSB) among individuals with autism spectrum disorder (ASD) and co-morbid intellectual disability (ID) has emerged as a complex and under-researched clinical and social concern. While the majority of individuals with ASD and ID are not sexually harmful, a small but significant subgroup presents with behaviours that violate social norms, legal boundaries, or the rights of others [1]. These behaviours often arise from an interaction of neurodevelopmental characteristics, cognitive limitations, social communication impairments, emotional dysregulation, and restricted understanding of consent, privacy, and sexual norms [2][3].

The current models of explaining HSB have mostly been formulated in general groups of offenders and often do not include the autism-specific characteristics of theory-of-mind deficiencies, sensory sensitivities, thinking rigidity, obsessive interests, and social misunderstanding vulnerability [4][5]. In ASD with ID, the problems are even more complicated by lowered adaptive functioning, poor judgment, and lack of access to proper sexual education and support. Consequently, ASD and ID persons can be overrepresented in safeguarding and criminal justice as a result of failures to appreciate their neurodevelopmental requirements [6].

The ultimate aim of this research is to establish a multicomponent explanatory framework of harmful sexual behaviour among people with autism and other co-morbid intellectual disability that incorporates neurodevelopmental, psychological, social, environmental, and systemic aspects [7][8]. The model will set aside the single-cause explanations and offer a holistic model to guide assessment, prevention, and intervention measures [9].

Although there is an increasing awareness that linking neurodevelopmental disorders to harmful sexual behaviour is an interaction, a number of gaps exist. First, current research often treats autism, intellectual disability, and sexual offending as separate domains, resulting in fragmented and incomplete explanations. Second, the majority of the available models are deficit-driven or risk-oriented and lack the ability to provide an adequate separation between intentional sexual offending and developmental misunderstanding or unmet support behaviours [10]. Third, there are insufficient integrative models that explain the cumulative and interactive impact of personal vulnerabilities, environmental factors, and system failures, especially in forensic and protective contexts. Lastly, only a limited number of evidence-based guidelines are specifically designed to work with individuals with ASD and ID, resulting in poor consistency in responding to and obtaining easy outcomes by professionals [11].

The study hypothesis is that the impact of harmful sexual behaviour among individuals with autism and co-morbid intellectual disability is best discussed as due to a cumulative interaction of a number of components rather than the impact of a single risk factor. Specifically, the hypothesis is that social cognition, emotional control deficiency, and sexual knowledge deficiency, in turn, together with environmental stressors, trauma exposure, lack of support networks, and bad professional response, are all reasons that add to the risks of HSB. A multicomponent model will therefore provide superior explanatory and practical utility compared to single-factor or generic offender models [12].

This study makes several key contributions to the field. First, it proposes a new multicomponent model, which directly incorporates developmental peculiarities of autism and ID in the explanation of harmful sexual behaviour. Second, it is an intersection of clinical, forensic, and social views, which proposes an integrated paradigm that can be used in a variety of mental health, safeguarding, and criminal justice settings. Third, the model promotes a transition of punitive interpretations in developmentally informed, preventative, and rehabilitative strategies. Lastly, it also establishes the conceptual basis of the future empirical studies, policy formulation, and creation of customized interventions to minimize harm without compromising the rights and well-being of people with ASD and intellectual disability.

The article consists of six major sections. The Introduction provides the background, gap in the research, objectives, hypothesis, and main contributions of the suggested multicomponent model. The Literature Survey reviews empirical and theoretical foundations related to ASD, intellectual disability, and harmful sexual behaviour. The materials and methods section reports on the mixed method design, recruitment of participants, and the measurement tools, as well as the statistical model and Delphi validation procedure. Results are descriptive statistics, correlation results, regression results, structural equation modeling,

and expert validation results. Findings are interpreted in a systems-based framework in the Discussion. The conclusion summarizes the important results and implications as well as future research directions.

Literature Survey

Harmful sexual behaviour (HSB) among individuals with autism spectrum disorder (ASD), particularly those with comorbid intellectual disability (ID), has emerged as a complex clinical and forensic concern requiring multidimensional understanding. Recent studies have demonstrated that the lack of social communication, sexual ignorance, emotional dysregulation, and situational vulnerabilities are the factors affecting sexual behaviour in ASD but not deviance [2][18]. According to systematic reviews, sexual health education and adaptive sexuality training of autistic people have considerable gaps, which can be the basis of the development of boundary violation, and inappropriate behaviours in combination with cognitive limitations [10][14].

Intervention-oriented research gives more focus on structured and skills-based interventions. Group cognitive behavioural therapy (CBT) has already shown potential results in treating men with ID and/or autism with HSB, especially regarding self-regulation and social cognition [3]. In the same way, the non-pharmacological behavioural interventions based on the functional assessment and relapse prevention models prove to be effective in minimizing sexually inappropriate behaviour [4][5]. An accelerated assessment of evidence provided by [11] also points out the necessity of a personalized, trauma-sensitive, and developmentally sensitive approach to the group of autistic adolescents with HSB. Nevertheless, pharmacological interventions are still inadequately developed, and reviews of literature indicate that aggressive states related to it should be used cautiously and selectively, not at the expense of the fundamental sexual behaviour [12].

Broader behavioural vulnerability models support a multicomponent framework. Longitudinal studies show that there are correlations between autistic characteristics and the occurrence of various risk behaviours in adolescence, implying that there are regulatory and social-cognitive processes with which these variables are connected [17]. The heterogeneity of ASD groups is also reported by multi-method profiling of social functioning, which attests to the fact that an individual approach to assessment models is needed [8][9]. Exposure to stressors associated with stigma and trauma linked with autistic individuals was also found to be associated with adverse mental health outcomes [19].

The assessment of the multidisciplinary assessment system, behavioural risk management, and systemic coordination are the pillars of integrated care models in forensic and intellectual disability services [6][15]. New models are focused on lifespan-related ways of addressing the issue of challenging behaviour, such as cognitive vulnerability, environmental reinforcement, and psychiatric comorbidity [16]. The interaction between the neurobiological vulnerability and the environment is also emphasized in the research of health and behavioural phenotypes among neurodevelopmental groups [13][20].

Most studies, in spite of emerging evidence, are single-domain studies, e.g., intervention efficacy, sexual education, or behavioural risk. An integrative gap exists between neurodevelopmental vulnerability, emotional regulation, exposure to trauma, lack of social cognition, and systemic service factors to be incorporated into a single explanatory framework. This makes a multicomponent model justified to explain the dynamic interplay of personal, relational, and environmental factors to cause harmful sexual behaviour in ASD with comorbid intellectual disability. The reviewed literature provides empirical and theoretical foundations for the proposed multicomponent model by highlighting the roles of emotional dysregulation, social cognition deficits, trauma exposure, and environmental influences in harmful sexual behaviour. It justifies the necessity of a systems-based structure that can inform the assessment, intervention, and service planning in ASD comorbid with intellectual disability.

Materials and Methods

Study Design

This study adopted a mixed-method, model-development design integrating systematic literature synthesis, clinical data analysis, and expert consensus procedures. The aim was to construct and validate a multicomponent theoretical model explaining the emergence and maintenance of harmful sexual behaviour (HSB) in individuals with autism spectrum

disorder (ASD) and comorbid intellectual disability (ID). The research was conducted in three sequential phases: conceptual framework development, empirical component mapping, and model validation.

Phase I: Conceptual Framework Development

A literature review was conducted integratively to find the biological, psychological, social, developmental, and environmental factors linked to harmful sexual behaviour among ASD and ID patients. PubMed, Scopus, PsycINFO, and Web of Science electronic databases were searched with predetermined keywords connected to the concept of autism, intellectual disability, harmful sexual behaviour, risk factors, and forensic vulnerability. Peer-reviewed articles published in English between 2000 and 2025 were considered.

Inclusion criteria consisted of empirical studies, systematic reviews, clinical case analyses, and theoretical papers focusing on ASD with ID and sexually inappropriate or harmful behaviour. Studies exclusively examining neurotypical populations or ASD without intellectual impairment were excluded unless they provided transferable mechanistic insights. Coded data were organized into themes that resulted in the discovery of recurring domains, which included neurocognitive deficits, social communication impairment, sexual knowledge deficits, trauma exposure, psychiatric comorbidity, impulsivity, environmental reinforcement, and caregiver patterns of responses.

The identified domains were organized into preliminary model components reflecting intrapersonal, interpersonal, contextual, and systemic influences.

Phase II: Empirical Component Mapping

To operationalize the model components, clinical and behavioral data were collected from individuals diagnosed with ASD and comorbid ID who had documented incidents of harmful sexual behavior. Participants were recruited from forensic psychiatric services, specialized disability services, and community-based rehabilitation centers. The institutional review board gave ethical approval, and informed consent was taken where necessary.

Cognitive functioning, adaptive behavior, autism severity, emotional regulation capability, impulse control, trauma history, sexual knowledge, and social understanding were measured using standardized assessment tools. Behavioral incident reports were reviewed to classify types of harmful sexual behaviour and contextual triggers.

Quantitative analyses were conducted to identify associations between component domains and behavioural outcomes. Structural equation modeling was employed to test interactions among neurodevelopmental vulnerabilities, psychosocial stressors, environmental contingencies, and behavioural expression. Qualitative case analyses were also performed to explore dynamic pathways not fully captured through quantitative measures.

Phase III: Expert Validation and Model Refinement

The multicomponent model was developed and tested with the help of a modified Delphi approach. The iterative rounds of review were done by a panel of experts, such as forensic psychiatrists, clinical psychologists, behavioral analysts, special educators, and legal professionals. The experts have assessed the lucidity, theoretical unity, clinical utility, and completeness of the suggested components of models.

Feedback was analyzed and incorporated to refine component definitions, clarify interaction pathways, and ensure ecological validity. Consensus was defined as agreement by at least 80% of panel members regarding model structure and domain inclusion.

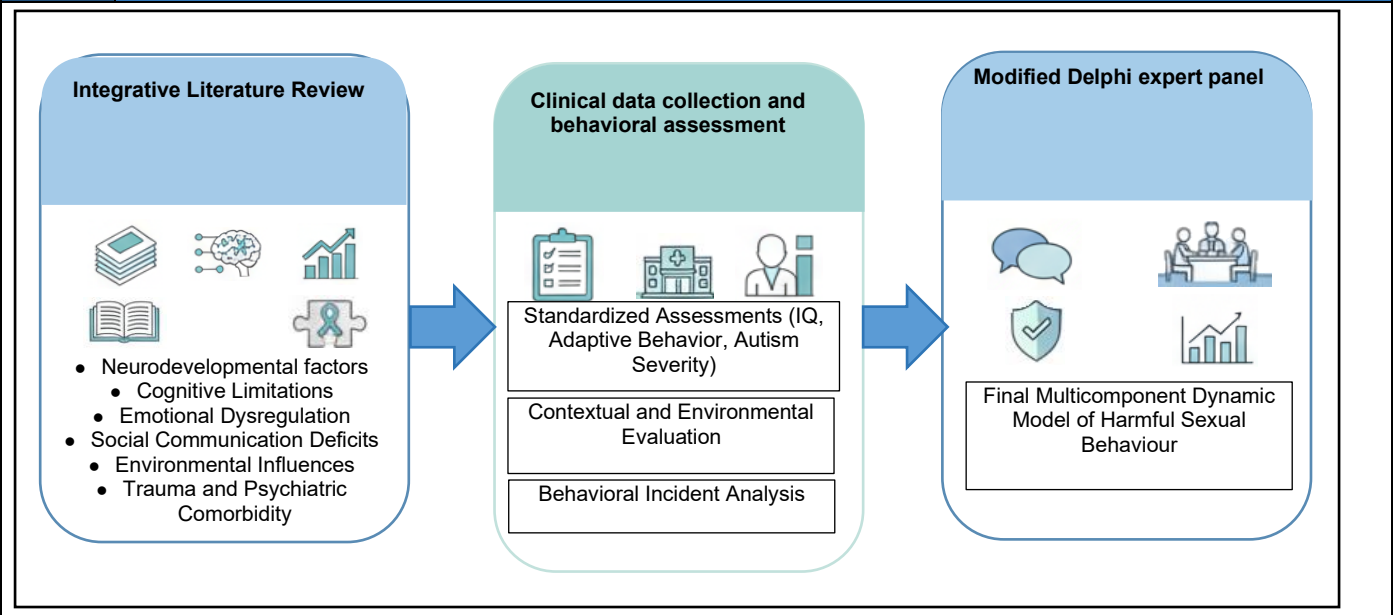
Model Integration and Finalization

The finalized multicomponent model conceptualizes harmful sexual behaviour as the outcome of interacting domains, including neurodevelopmental impairments, cognitive limitations, emotional dysregulation, social learning deficits, environmental reinforcement patterns, trauma exposure, and systemic response factors. The model incorporates both distal vulnerability factors and proximal triggers, emphasizing dynamic interactions rather than linear causation.

Figure 1 illustrates the three-phase methodological design used to develop and validate the proposed multicomponent model. The framework integrates (1) conceptual synthesis

through systematic literature review, (2) empirical component mapping via clinical assessment and statistical modeling, and (3) expert validation using a modified Delphi process. Arrows indicate the sequential and iterative progression from theoretical identification of risk domains to empirical testing and final model refinement.

Figure 1 Methodological Framework for Developing the Multicomponent Model of Harmful Sexual Behaviour in Autism with Comorbid Intellectual Disability



Data Analysis

The quantitative data were processed with the help of IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA) and IBM SPSS AMOS version 24.0, which is used to analyze the structural equations. Given the fact that descriptive statistics were required to characterize features about the participants, means, standard deviations, and frequencies were computed. Correlation analyses and multiple regression modeling were done by Pearson to determine the relationship of predictors among the domains of neurodevelopmental, emotional, social, and environmental. Maximum likelihood estimation, Structural equation modeling (SEM), measured both direct and indirect pathways leading to harmful sexual behaviour. The model fit was checked based on the standard indices such as Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), root mean square error of approximation (RMSEA), and chi-square statistics. Qualitative findings were synthesized using thematic analysis conducted in NVivo version 12 Plus (QSR International) to support interpretation and refinement of the multicomponent model.

Ethical Considerations

Given the sensitivity of harmful sexual behaviour research, strict confidentiality protocols were implemented. Data were anonymized, and participant identifiers were removed. All procedures complied with ethical standards for research involving vulnerable populations. Protective measures were put in place so that such participation did not come in the way of clinical treatment or legal proceedings.

Results

Sample Characteristics

A total of 124 individuals diagnosed with autism spectrum disorder and comorbid Intellectual Disability were included in the empirical phase. The participants were enlisted in forensic psychiatric units, special disability services, and community rehabilitation environments. The average sample age was 24.6 years (SD = 6.8), where 82% of the participants were males and 18% were females. The intellectual functioning was mild to moderate intellectual disability, and the Full-Scale IQ mean was 58.4 (SD = 9.7). Autism severity measured using

the Autism Diagnostic Observation Schedule–2 (ADOS-2) indicated moderate to high symptom levels across the cohort.

Table 1	ITSO Application Gaps in Neurodiversity Literature
Variable	Mean (SD) / n (%)
Age (years)	24.6 (6.8)
Male	102 (82%)
Female	22 (18%)
Full-Scale IQ	58.4 (9.7)
Vineland Adaptive Composite	61.2 (8.9)
ADOS-2 Severity Score	7.8 (1.6)
History of Trauma	64 (52%)
Psychiatric Comorbidity	71 (57%)

Table 1 provides a summary of key characteristics for a sample group. The average age of the participants, most of whom are male, is less than that of females. The group has a mean Full-Scale IQ of 58.4 (SD = 9.7) and a Vineland Adaptive Composite score of 61.2 (SD = 8.9). The average ADOS-2 severity score is 7.8 (SD = 1.6), indicating the level of autism spectrum traits. A history of trauma was reported by 52% of participants, and 57% have a psychiatric comorbidity.

Prevalence and Typology of Harmful Sexual Behaviour

Behavioral incident analysis identified three primary categories of harmful sexual behaviour: inappropriate sexual touching, coercive behaviour, and boundary-violating behaviours without physical contact. Inappropriate touching was the most prevalent category, occurring in 46% of participants. Incidents that were coercive or force-based were reported in 21%. Non-contact boundary violations, including persistent inappropriate verbal behaviour, were observed in 33% of participants.

Severity scores were calculated using a standardized behavioural impact index derived from incident frequency and contextual risk factors:

$$SI_i = \frac{F_i \times W_i}{T_i} \quad (1)$$

In equation (1), the Severity Index (SI) for an individual is calculated using the frequency of harmful sexual behaviour incidents (F_i), the contextual risk weight (W_i) assigned to the incident type, and the monitoring duration (T_i) in months. This standardizes behavioural severity across participants with varying observation periods. The mean Severity Index score across participants was 2.84 (SD = 1.21), indicating moderate behavioural risk levels.

Neurocognitive and Emotional Regulation Correlates

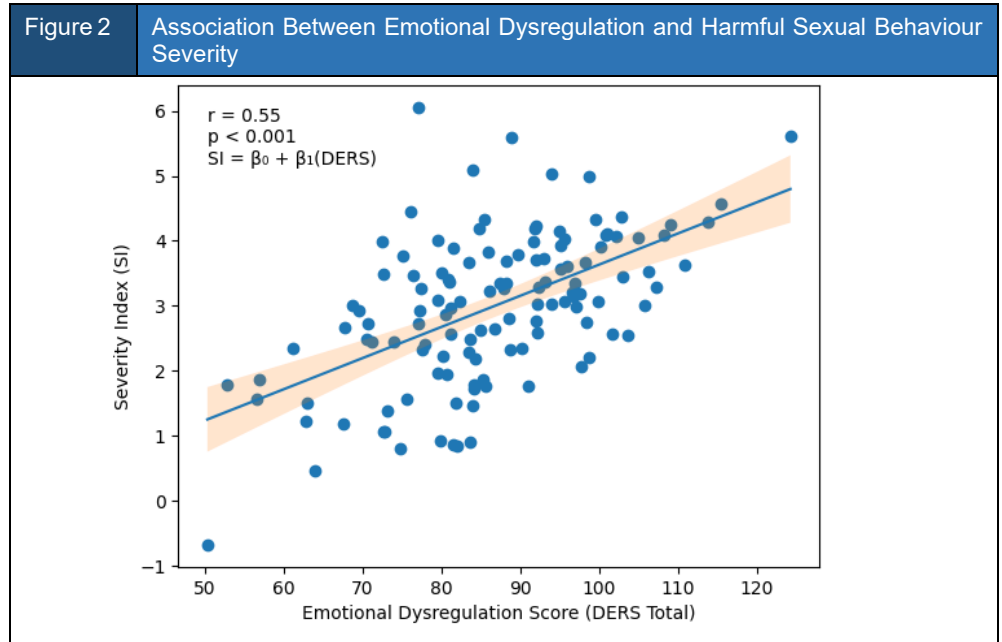
Pearson correlation analyses revealed significant associations between harmful sexual behaviour severity and neurocognitive as well as emotional regulation variables. Full-Scale IQ showed a moderate negative relationship with the scores of the Severity Index ($r = -0.41$, $p < 0.01$), showing that the behavioural severity of people with low cognitive functioning is higher. Adaptive functioning showed a similar negative association ($r = -0.48$, $p < 0.01$).

The strongest positive correlation with behavioural severity was found between emotional dysregulation, measured by the Difficulties in Emotion Regulation Scale (DERS) ($r = 0.63$, $p < 0.001$). The subscale of impulse control was found to be most predictive ($r = 0.59$, $p < 0.001$). The severity had a positive value of score related to exposure to trauma ($r = 0.37$, $p < 0.05$), and the amount of psychiatric comorbidity was also significantly correlated ($r = 0.44$, $p < 0.01$).

This is represented as Figure 2, which shows the positive relationship between harmful sexual behaviour severity and emotional dysregulation. The association was found to be statistically significant ($r = 0.63$, $p < 0.001$). The regression line expresses that the high values of the DERS scores show the high values of the Severity Index. The darkened area signifies the 95 percent confidence interval of the regression estimate.

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Variable	Correlation with Severity Index (r)	p-value
Full-Scale IQ	-0.41	<0.01
Adaptive Functioning	-0.48	<0.01
Emotional Dysregulation (DERS Total)	0.63	<0.001
Impulse Control Deficit	0.59	<0.001
Trauma Exposure Score	0.37	<0.05
Psychiatric Comorbidity Count	0.44	<0.01

The following Table 2 indicates the correlation coefficients (r) between the different variables and the Severity Index with the corresponding p-values. The Full-Scale IQ has a negative correlation with Adaptive Functioning and a positive correlation with Emotional Dysregulation, Impulse Control Deficit, Trauma Exposure, and Count of Psychiatric Comorbidity. It is important to note that there are strong positive correlations between the Severity Index and Emotional Dysregulation and Impulse Control Deficit.

Multiple Regression Analysis

A hierarchical multiple regression model was conducted to identify independent predictors of harmful sexual behaviour severity.

The regression equation was:

$$HSB = \beta_0 + \beta_1 ED + \beta_2 SC + \beta_3 ER + \epsilon \quad (2)$$

In equation (2), ED represents Emotional Dysregulation, SC represents Social Cognition Deficit, and ER represents Environmental Reinforcement.

The most significant independent predictor was Emotional Dysregulation ($\beta = 0.47$, $p = 0.001$), then Social Cognition Deficit ($\beta = 0.29$, $p < 0.01$). Environmental Reinforcement demonstrated a smaller but significant effect ($\beta = 0.21$, $p < 0.05$). The overall regression model was statistically significant ($F = 21.84$, $p < 0.001$) and explained 54% of the variance in behavioural severity (Adjusted $R^2 = 0.54$).

Structural Equation Modeling of the Multicomponent Framework

Structural equation modeling was conducted using AMOS to test the hypothesized multicomponent interaction model. The model included the following latent constructs: Neurodevelopmental Vulnerability, Emotional Dysregulation, Social Cognition Deficit, Environmental Reinforcement, and Harmful Sexual Behaviour Expression.

Structural equation modeling using maximum likelihood estimation was conducted to test the hypothesized multicomponent interaction model. The structural equation model is expressed as:

$$\eta = B\eta + \Gamma\xi + \zeta$$

Specifically:

$$\eta_{HSB} = \gamma_1\xi_{NV} + \beta_1\eta_{ED} + \beta_2\eta_{SC} + \gamma_2\xi_{ER} + \zeta \quad (3)$$

In equation (3), η_{HSB} represents harmful sexual behaviour, ξ_{NV} represents neurodevelopmental vulnerability, η_{ED} represents emotional dysregulation, η_{SC} represents social cognition deficit, and ξ_{ER} represents environmental reinforcement.

Model fit indices indicated acceptable fit to the data:

Chi-square/df = 1.98

Comparative Fit Index (CFI) = 0.93

Tucker–Lewis Index (TLI) = 0.91

Root Mean Square Error of Approximation (RMSEA) = 0.067

Path coefficients demonstrated that Emotional Dysregulation had the strongest direct effect on harmful sexual behaviour ($\beta = 0.52$, $p < 0.001$). Neurodevelopmental Vulnerability showed an indirect effect mediated through Social Cognition Deficit (β indirect = 0.28, $p < 0.01$). Environmental Reinforcement significantly moderated the pathway between impulsivity and behavioural expression (interaction term $\beta = 0.31$, $p < 0.05$).

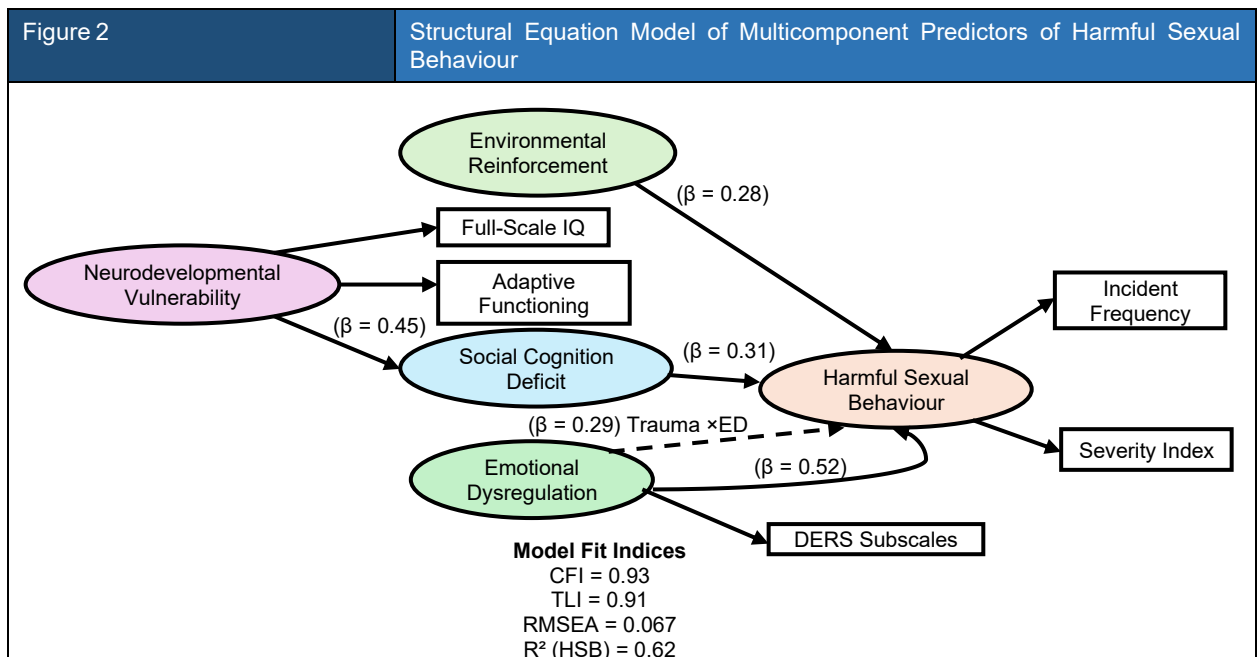


Figure 2 illustrates direct and indirect pathways contributing to harmful sexual behaviour. Standardized directional path coefficients are presented in directional arrows. The strongest direct impact was shown by emotional dysregulation, and neurodevelopmental vulnerability showed the indirect impact through the deficits in social cognition. The model fit indices showed good fit ($\chi^2/df = 1.98$; CFI = 0.93; TLI = 0.91; RMSEA = 0.067).

Trauma and Psychiatric Moderation Effects

Individuals who had a history of trauma present in documentaries showed by far greater Severity Index scores than those who were not exposed to trauma ($t = 3.14$, $p < 0.01$). Comorbid conditions such as ADHD and mood disorders amplified impulsivity-related behavioural expression.

The interaction coefficient was significant ($\beta = 0.29$, $p < 0.05$), indicating that trauma exposure strengthened the association between emotional dysregulation and harmful sexual behaviour. Psychiatric comorbidities, particularly ADHD and mood disorders, amplified impulsivity-related pathways.

Expert Delphi Validation Outcomes

There were 18 multidisciplinary experts who were involved in the Delphi validation stage. Around 80% consensus was obtained in all domains of the core models after two rounds of consensus. According to the experts, the model scored high on theoretical coherence (Mean = 4.6/5), clinical applicability (Mean = 4.4/5), and explanatory adequacy (Mean = 4.5/5). Feedback primarily focused on clarifying distinctions between distal vulnerability factors and proximal triggers.

Final Model Integration

The finalized multicomponent model demonstrates that harmful sexual behaviour in individuals with autism and comorbid intellectual disability emerges from dynamic interactions among neurodevelopmental impairment, emotional dysregulation, social cognition deficits, trauma exposure, environmental reinforcement contingencies, and systemic response patterns. The integrated model supports a non-linear, systems-based understanding rather than a single-factor causal explanation, emphasizing interaction effects and mediating pathways.

Discussion

The present study developed and empirically tested a multicomponent model explaining harmful sexual behaviour (HSB) in individuals with autism spectrum disorder (ASD) and comorbid intellectual disability (ID). The findings support a systems-based conceptualization in which neurodevelopmental vulnerabilities, emotional dysregulation, social cognition deficits, trauma exposure, and environmental reinforcement interact dynamically to influence behavioural outcomes.

One of the most significant findings was the strong positive association between emotional dysregulation and HSB severity. Emotional dysregulation was the most correlated with the Severity Index ($r = 0.63$, $p < 0.001$), and it was found to be the strongest independent predictor in the regression equation ($\beta = 0.47$, $p < 0.001$). Structural equation modeling further confirmed its central role, showing the strongest direct path to harmful sexual behaviour ($\beta = 0.52$, $p < 0.001$). These findings highlight emotional regulation impairment as a core mechanism underlying behavioural risk in this population. Neurocognitive functioning also played a significant role. The Full-Scale IQ and the adaptive functioning demonstrated a negative relationship with the behavioural severity and suggest that limitations in cognition may result in the reduction of impulse control, social judgment, and boundary understanding. But the outcomes of the SEM suggest that neurodevelopmental vulnerability has a direct and indirect effect on HSB, in the form of social cognition deficits. This strengthens the view that behaviour expression can be mediated through deficits with the meaning of social cues and consent.

Psychiatric comorbidity and exposure to trauma increased behavioural risk. The moderating effect of the trauma implies that adverse experiences may enhance the pathways of emotional dysregulation, therefore increasing the likelihood of damaging behaviour. This concurs with trauma-sensitive notions of forensic vulnerability and emphasizes the importance of situational and developmental problems. The overall regression model predicted 54% of the variance in behavioural severity, with the SEM predicting 62%, and it has a strong predictive power. Notably, the model fit statistics showed a satisfactory fit, which establishes a high-quality structure of the presented framework. Emotional dysregulation was the strongest predictor of the severity of harmful sexual behaviour. Neurodevelopmental vulnerability exerted both direct and indirect effects through social cognition deficits. Trauma exposure strengthened the relationship between emotional dysregulation and behavioural expression. The multicomponent model demonstrated strong explanatory capacity and acceptable structural fit. Such results are consistent with an active, interaction-based perspective of harmful sexual behaviour in ASD with comorbid ID and offer the basis of providing specific intervention strategies that would target emotional regulation, trauma-informed care, and social cognition training.

Conclusion

The present study developed and validated a multicomponent model explaining harmful sexual behaviour (HSB) in individuals with autism spectrum disorder and comorbid intellectual disability. The findings demonstrated that emotional dysregulation was the strongest predictor of behavioural severity, showing a robust positive correlation with the Severity Index ($r = 0.63$, $p < 0.001$) and the largest standardized regression coefficient in the hierarchical model ($\beta = 0.47$, $p < 0.001$). Structural equation modeling further confirmed this effect, with emotional dysregulation exerting the strongest direct influence on HSB ($\beta = 0.52$, $p < 0.001$). The overall regression model explained 54% of the variance (Adjusted $R^2 = 0.54$), while the structural model accounted for 62% of the variance in behavioural severity, demonstrating substantial explanatory power and acceptable fit (CFI = 0.93; RMSEA = 0.067). Neurodevelopmental vulnerability and social cognition deficits contributed both directly and indirectly to behavioural outcomes, and trauma exposure significantly moderated the emotional dysregulation pathway ($\beta = 0.29$, $p < 0.05$). Such results favor a process, interactive-based model over a one-cause theory. Future studies are to include longitudinal design, larger multisite, and intervention trials to improve emotional regulation and trauma-informed care. Predictive accuracy and individual risk management approaches can be further optimised by incorporating neurobiological markers and electronic behavioural surveillance.

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