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Uncovering the Drivers of Violence Against Women and Girls in Brazilian Higher Education: A Partial Least Squares Structural Equation Modelling Approach

Muhammad Qasim Rana*[1], Angela Lee[1], José Fernando Rodrigues Bezerra[2], Lekan Damilola Ojo*[3] and Guilherme Hissa Villas Boas[4]

[1]University of the Built Environment, Horizons, Reading RG1 4BS, UK
[2]Department of Geography, State University of Maranhão, São Luís 65055-310, Brazil
[3]Department of Building and Real Estate, Hong Kong Polytechnic University, Hung Hom, Hong Kong
[4]Department of Geography, Federal University of Rio de Janeiro, Rio de Janeiro 21941-596, Brazil

Abstract

Violence against women and girls (VAWG) remains a pervasive challenge within higher education worldwide, and Brazil is no exception. Understanding the underlying causes of such violence is essential for developing effective prevention and policy interventions. This study investigates the key determinants of VAWG in Brazilian higher education through a structured, data-driven analysis. Using a quantitative approach, structured questionnaires were distributed to undergraduate and postgraduate students across multiple Brazilian universities, yielding 247 valid responses. The data were analysed using exploratory factor analysis with Promax rotation and Partial Least Squares Structural Equation Modelling (PLS-SEM). Results from the factor analysis revealed strong intercorrelations among community-level factors and other dimensions of VAWG, while societal factors also emerged as highly influential. Significant path coefficients were identified between individual (β = 0.240), interpersonal (β = 0.312), community (β = 0.249), institutional (β = 0.241), and societal (β = 0.251) levels and the overall causal structure of VAWG. Collectively, the 24 critical causal factors identified accounted for 99.1% of the total variance in VAWG determinants. The study contributes to the theoretical understanding of VAWG by integrating five key causal levels and employing a robust statistical framework. Practically, it offers actionable insights for policymakers, university leaders, and educators to design multi-level, evidence-based strategies that promote safer and more gender-equitable academic environments.

Keywords: Violence against women; Brazilian universities; PLS-SEM; Higher education

Introduction

Violence against women and girls (VAWG) remains a pervasive global challenge, deeply embedded in historical, cultural, and socio-economic structures that perpetuate gender inequality. The United Nations General Assembly (1993) defines VAWG as any act of gender-based violence (GBV) that results in physical, sexual, or psychological harm or suffering, whether occurring in public or private life. Intimate partner violence (IPV), a major subset of GBV, encompasses physical aggression, sexual coercion, psychological abuse, and controlling behaviours; forms of violence that disproportionately affect women [1]. Globally, approximately one in three women have experienced IPV in their lifetime [2]. In Latin America, a meta-analysis by the Pan American Health Organization [3] reports that 16.7% of women aged 15–49 have experienced physical or sexual IPV, while 33% report recurrent abuse. Despite the existence of robust legal frameworks and advocacy efforts, the persistence of such violence underscores the urgent need to understand its structural and contextual drivers, particularly within higher education institutions - spaces that shape future leaders and societal norms [4].

Higher education institutions, though envisioned as sites of empowerment and intellectual growth, paradoxically remain environments where VAWG is widespread [5]. In Brazil, universities reflect and reproduce broader societal inequalities, where patriarchal norms, cultural acceptance of violence, and socio-economic disparities intersect to sustain GBV [6]. Empirical studies reveal that VAWG in academic settings manifests through sexual harassment, coercion, and physical assault - often perpetrated by peers, faculty members, or administrative staff [2]. Institutional inaction, hierarchical power dynamics, and the normalization of violence further exacerbate the problem. The World Health Organization (2018) identifies lack of education, financial dependency, and limited decision-making autonomy as key risk factors for IPV. Additional contributors such as substance abuse and entrenched gender stereotypes intensify these patterns, making higher education both a mirror and a microcosm of wider societal inequalities [7]. In Brazil, the intersections of race, class, and gender intensify women's vulnerability to violence. Evidence shows that Black women and those with lower educational attainment face a disproportionately higher risk of IPV, reflecting deep-seated socio-economic inequities [3]. Broader patterns of societal violence, including high homicide rates, have also been correlated with increased GBV prevalence [2]. Although Brazil has implemented progressive legislative measures - most notably the Maria da Penha Law (2006) - inconsistent enforcement and enduring cultural stigma hinder their effectiveness. Many survivors continue to face barriers to justice, including institutional negligence and economic hardship. Data from the National Survey of Health (Pesquisa Nacional de Saúde - PNS) further highlight the severe consequences of IPV, such as physical

***Corresponding author:** John Richardson, Department of Architectural Engineering, University of RRTM, Switzerland, E-mail: john.richardson@gmail.com

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injury, psychological trauma, and diminished economic participation among women [8]. These challenges are particularly acute for women in higher education, who often encounter unsafe campus environments, limited institutional support, and persistent gender biases.

While research on GBV in Brazil has expanded in recent years, studies focusing specifically on the structural causes of VAWG within universities remain limited. Existing literature often emphasizes national trends or domestic violence more broadly, leaving a critical gap in understanding the unique socio-cultural and institutional dynamics that sustain violence in academic contexts [9-12]. This study seeks to address this gap by systematically examining the underlying socio-economic, cultural, and institutional determinants of VAWG within Brazilian higher education. By adopting a multidimensional framework grounded in the ecological model of violence, the research explores the interrelationships among individual, interpersonal, community, institutional, and societal factors.

The findings aim to contribute both theoretically and practically: first, by deepening understanding of how structural inequalities and campus cultures interact to perpetuate gender-based violence; and second, by providing evidence-based recommendations for policymakers, university administrators, and educators. Addressing VAWG in higher education is not only a moral and social imperative but also essential for achieving gender equality, improving institutional integrity, and enabling women's full participation in academic and professional life. Ultimately, this study aspires to support the development of safer, more equitable, and inclusive university environments in Brazil through the identification of critical causal factors and the design of targeted, multi-level interventions.

Literature review

Overview of statistics of violence against girls and women

Violence against women and girls (VAWG) represents a profound public health crisis and a violation of women's fundamental human and social rights. The World Health Organization (WHO, 2024) [13] estimates that approximately one in three women worldwide have experienced intimate partner violence (IPV) in their lifetime. As of 2018, the global prevalence of IPV and non-partner sexual violence accounted for around 641 million women affected. Regional variations remain significant: approximately 15% of women in North America and Australia and 19% in New Zealand have experienced VAWG (Australian Institute of Health and Welfare, 2025). The prevalence of IPV is reported at 20% in the Western Pacific, 22% in high-income nations and Europe, 25% in the Americas, 31% in the Eastern Mediterranean, and 33% in both Africa and South-East Asia (WHO, 2024) [13]. Alarmingly, intimate partners are responsible for 38% of all female homicides worldwide (WHO, 2024) [13], while an additional 6% of women have been sexually assaulted by someone other than an intimate partner [2].

[14] further reports that 12.8% of women aged 15–49 experienced physical and/or sexual IPV within the year preceding the study. Regional disparities are particularly stark in Asia, where Afghanistan records the highest prevalence (34.7%) of women and girls experiencing VAWG, while Singapore (2.4%) and Hong Kong (2.5%) exhibit the lowest rates [14]. In Brazil, the situation remains critical; 33.4% of women aged 16 years or older have experienced physical or sexual violence by a current or former intimate partner. This figure is 27% higher than the global average reported by [2], highlighting the severity and persistence of gender-based violence within the Brazilian context.

Such alarming statistics underscore the importance of examining how patterns of VAWG manifest within higher education institutions, where gender hierarchies, power dynamics, and socio-cultural norms intersect. Understanding these dynamics is essential for developing targeted interventions that promote safer, more equitable academic environments and contribute to broader societal change.

Overview of violence against women and girls in brazilian higher education

Universities, which should foster intellectual growth and personal development, paradoxically remain environments where many women experience violence and discrimination. Female students, faculty, and staff often face multiple forms of abuse, including physical assault, sexual harassment, emotional coercion, and economic exploitation [9]. In Brazil, research has shown that harassment and violence against women within higher education are widespread and frequently perpetrated by peers, faculty members, and administrative staff [14, 15].

Cultural norms that perpetuate gender inequality, coupled with institutional inaction, often lead to the normalization and dismissal of such incidents [10]. Women from marginalized groups, including those of lower socio-economic status and racial minorities, face heightened risks of victimization [12,16]. The lack of clear institutional policies, effective reporting mechanisms, and support structures further exacerbates this issue [17].

Fear of retaliation, victim-blaming, and weak legal enforcement discourage survivors from reporting violence, thereby reinforcing a pervasive culture of silence and impunity [8]. Economic dependency compounds this vulnerability, as some female students feel compelled to tolerate abusive behaviour due to reliance on scholarships, employment, or institutional support [18]. The absence of accountability mechanisms thus enables perpetrators to operate with impunity within academic spaces [1].

Addressing violence within higher education requires recognizing its multidimensional nature - encompassing physical, sexual, emotional, and controlling behaviours [19]- and understanding how these are embedded within broader institutional and societal structures [20,21]. Developing targeted interventions and robust institutional frameworks is therefore essential to transforming Brazilian universities into safe, equitable, and inclusive environments for all members of the academic community.

Overview of forms of violence against women and girls

Universities - intended as spaces for intellectual growth and personal empowerment - too often expose women to multiple forms of violence and discrimination. Female students, faculty, and staff in Brazil face physical assault, sexual harassment, psychological abuse, and economic coercion within academic settings [9]. Studies reveal that harassment and abuse are frequently perpetrated by peers, faculty, or administrative staff [14,15] and are often minimized or normalized by institutional cultures that reflect broader societal gender inequalities [10]. Women from marginalized racial and socio-economic groups experience higher risks of victimization [12,16], yet institutional responses remain inadequate. Many universities lack clear reporting mechanisms, protective policies, and survivor support services [17]. Fear of retaliation, stigma, and ineffective legal enforcement discourage survivors from reporting violence, perpetuating a cycle of silence and impunity [8]. Economic dependency further deepens vulnerability, as some women endure abusive conditions due to reliance on

scholarships, employment, or institutional aid [18]. The absence of accountability mechanisms allows perpetrators to act unchecked [1]. Addressing VAWG within higher education demands a systemic and intersectional approach that recognizes violence as multidimensional - encompassing physical, sexual, emotional, and controlling behaviors [19]- and deeply embedded in institutional and societal structures [20, 21] see Table 1). Only through structural reform and cultural change can Brazilian universities become truly safe, equitable, and inclusive spaces for all (Table1).

Causes of violence against women and girls

Violence against women and girls (VAWG) in Brazilian higher education reflects deeply rooted social, economic, cultural, and institutional inequalities [10]. Rather than serving as safe environments for intellectual and personal development, universities often replicate patriarchal systems that sustain gender-based violence [11]. The persistence of VAWG arises from a complex interplay of factors - ranging from individual vulnerabilities to structural injustices - that reinforce women's subordination and limit access to justice.

Individual and socio-demographic factors. Research identifies socio-demographic characteristics, substance abuse, and adverse childhood experiences as major predictors of VAWG [22]. Low educational attainment is strongly associated with increased vulnerability, as limited access to education restricts women's economic opportunities and reinforces dependence on abusive partners [2]. Women from marginalized groups - particularly those facing racial and economic inequities - encounter systemic barriers to academic and professional advancement [23]. Alcohol and drug abuse also exacerbate violence by impairing judgment and increasing aggression [24]. Exposure to domestic violence during childhood normalizes abuse as part of adult relationships [2], while unresolved trauma and mental health disorders further increase aggression and emotional instability [25,12]. Displacement, family separation, and weak social support systems - especially in female-headed households - heighten vulnerability to abuse [26].

Interpersonal and household dynamics. Economic stress and poverty often act as catalysts for household violence, with women in low-income families disproportionately affected [2,23]. Patriarchal norms reinforce male dominance and normalize coercive control [24]. Early and forced marriages exacerbate women's powerlessness and limit autonomy. Shifting gender roles - such as women's increased participation in education and the workforce - can trigger insecurity among men accustomed to traditional hierarchies, resulting in retaliatory violence [9,26]. Educational disparities between partners often heighten these tensions [28], while unequal power dynamics foster controlling behaviours that restrict women's freedom and decision-making [9].

Cultural and community-level factors. Deeply ingrained cultural norms that normalize violence and prioritize male authority perpetuate VAWG [2]. In patriarchal societies, abuse is frequently dismissed as a private matter rather than a human rights violation [23]. Weak community sanctions, victim-blaming, and ineffective policing foster impunity [18]. Practices such as 'wife inheritance' and other patriarchal traditions further entrench women's subjugation [26]. On university campuses, these community-level patterns manifest as sexual harassment and gender-based violence, exacerbated by inadequate institutional responses [11].

Institutional and structural failures. Institutional weaknesses, such as limited female representation in leadership, inadequate reporting mechanisms, and lack of survivor support sustain environments where violence goes unchallenged [2,23]. Male-dominated judicial and security sectors often trivialize or mishandle cases, deterring survivors from reporting [26]. Corruption, bureaucratic inefficiencies, and insufficient accountability mechanisms in Brazil further undermine justice [24]. The exclusion of gender issues from peacebuilding and national policy agendas leaves VAWG marginalized in public discourse [12]. Strengthening institutional frameworks, increasing women's representation in decision-making, and enforcing accountability are crucial to breaking these cycles [16].

Societal and cultural systems. Ultimately, the persistence of VAWG reflects broader societal acceptance of male dominance and a culture of impunity. Hypermasculinity and rigid gender norms - particularly in regions affected by social inequality - reinforce aggression and control [27]. Survivors face stigma, victim-blaming, and institutional neglect, while perpetrators benefit from weak legal enforcement [25,23]. Addressing these systemic drivers requires not only stronger laws and institutional reform but also sustained cultural transformation through education and advocacy [10,12].

A summary of the causal factors of VAWG identified in the literature is presented in (Table 2).

Research methodology

Research design

This study employed a quantitative research design to investigate the underlying causes of violence against women and girls (VAWG) within Brazilian higher education institutions. A cross-sectional survey approach was adopted to collect data at a single point in time from a diverse and representative sample of university students [29]. This design was appropriate for identifying patterns and examining the relationships among multiple latent constructs that contribute to VAWG in academic settings. By utilizing structured, quantifiable data, the study enabled the application of advanced statistical analyses to uncover significant correlations and causal pathways between individual, interpersonal, institutional, and societal factors influencing VAWG.

Questionnaire development and data collection

The questionnaire was meticulously developed based on a review of existing literature and adaptation of previously validated instruments

Table 1: Forms of violence.

Forms of violence	Sources
Physical violence	Johnson (1995); WHO (2012); Zotareli et al. (2012); Bukuluki et al. (2013); Leite et al. (2017); Nakamura et al. (2023); Soster et al. (2024)
Sexual violence	Johnson (1995); WHO (2012); Zotareli et al. (2012); Leite et al. (2017); de Ávila (2018); Nakamura et al. (2023); Soster et al. (2024)
Socio-economic violence	Bukuluki et al. (2013)
Emotional (psychological) violence	WHO (2012); Zotareli et al. (2012); Bukuluki et al. (2013); Leite et al. (2017); de Ávila (2018); Nakamura et al. (2023); Soster et al. (2024)
Controlling behaviours	WHO (2012)

Table 2: Summary of the Causes of violence against women and girls.

Factors	Sources
Socio-demographic	WHO (2012); Murphy et al. (2023); Wachter et al. (2018)
Alcohol and drug abuse	Murphy et al. (2023); Wachter et al. (2018)
Low education	WHO (2012); Gibbs et al. (2020)
Experience of violence during childhood	Murphy et al. (2023)
Mental health and disabilities; personality disorder	WHO (2012); Murphy et al. (2023); Gibbs et al. (2020)
Displacement, separation from family, and female headed households	Murphy et al. (2023); Wachter et al. (2018)
Witnessing mother being beaten	WHO (2012); Gibbs et al. (2020)
Stress and poverty / Economic stress	Murphy et al. (2023); WHO (2012)
Conflict or dissatisfaction in relationship	WHO (2012)
Male dominance in the family	WHO (2012)
Child, early and forced marriage	Murphy et al. (2023); Ellsberg et al. (2021)
Unequal power and controlling behaviours	Murphy et al. (2023); Sikweyiya et al. (2020)
Changing gender roles due to conflict & displacement	Murphy et al. (2023); Ellsberg et al. (2021)
Disparity in education attainment	WHO (2012)
Normalization of violence and VAWG	WHO (2012); Murphy et al. (2023); Gibbs et al. (2020)
Opportunistic rape	Murphy et al. (2023); Ellsberg et al. (2021)
Community violence targeting women	Murphy et al. (2023)
Wife inheritance	Ellsberg et al. (2021)
Weak community sanction against VAWG	WHO (2012)
Lack of female representation in the security sector	Murphy et al. (2023)
Suppressed civil society	Murphy et al. (2023)
Abuse of power by humanitarians	Murphy et al. (2023)
Use of rape as weapon of war	Murphy et al. (2023)
Forced enlistment/abduction of women and girls	Murphy et al. (2023); Ellsberg et al. (2021)
Lack of attention to VAWG in peace agreement	Murphy et al. (2023)
Culture of impunity	Murphy et al. (2023)
Unequal gender dynamics	Murphy et al. (2023); Gibbs et al. (2020)
Patriarchal norms and practices	Murphy et al. (2023); Sikweyiya et al. (2020)
Lack of rule of law	Murphy et al. (2023)
Emphasis on hyper masculinities	Murphy et al. (2023)

on gender-based violence. The instrument was structured around the five key causal dimensions identified as influencing VAWG in higher education contexts, namely: individual, interpersonal, community, institutional, and societal factors [30]. Each construct comprised multiple items designed to capture participants' perceptions, experiences, and attitudes. All items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to capture the intensity of responses.

Prior to full-scale deployment, a pilot test assessed clarity, reliability, and contextual relevance, with feedback informing minor refinements to improve comprehension and eliminate ambiguity. The finalized survey was administered online via Google Forms between January and April 2025, ensuring accessibility across Brazilian universities. Participants were recruited through university mailing lists, academic networks, and student associations. To ensure inclusivity and representativeness, both undergraduate and postgraduate students from diverse disciplines and institutions were invited to participate.

Ethical considerations were rigorously observed. Participation was voluntary, with informed consent obtained prior to survey completion. The questionnaire was anonymous, with no identifying information collected, and participants were informed of their right to withdraw at any time. The study adhered to institutional ethical guidelines and Brazilian research regulations for human subjects, with safeguards in place to minimize psychological or social risks associated with discussing sensitive topics such as VAWG.

Sampling strategy

To ensure methodological rigor, a systematic sampling approach was adopted targeting individuals within Brazilian higher education who had either directly experienced or were aware of incidents of VAWG. Using Yamane's formula with a 5% margin of error, the required sample size was calculated as 396 participants. A total of 311 responses were received, of which 247 were valid and included in the final analysis, yielding a valid response rate of 62.4%.

Participants were recruited using a non-probability purposive sampling technique, ensuring inclusion of individuals with direct experience or relevant knowledge of VAWG in higher education contexts. This approach was particularly appropriate given the sensitive nature of the topic and the necessity of engaging respondents capable of providing informed, meaningful perspectives [31]. The sampling strategy also facilitated the collection of rich, targeted data suitable for advanced statistical analysis while maintaining ethical and practical considerations for participants' safety and confidentiality.

Method of data analysis

Data analysis was conducted in multiple stages to ensure reliability and validity. Descriptive statistics, including frequency distributions and percentages of participants' demographic information, were computed using SPSS (version 27). To explore the underlying structure of the causal factors of VAWG, exploratory factor analysis (EFA) with Promax rotation was performed, enabling the identification of latent

constructs and the interactions between variables.

Subsequently, Partial Least Squares Structural Equation Modelling (PLS-SEM) was conducted using SmartPLS to identify the significant causal factors that could be considered critical in contributing to VAWG [32]. PLS-SEM was particularly suitable because it is robust to violations of normality assumptions and is well-suited for exploratory research involving complex models with multiple constructs.

To ensure the adequacy of the sample for PLS-SEM, the "10-times rule" was applied, which recommends a minimum sample size ten times the maximum number of indicators in any construct or path. According to this criterion, a minimum of 30 responses would suffice. Additionally, an a priori power analysis using G*Power software indicated that a sample of 54 participants would be sufficient to detect moderate effect sizes at a power level of 0.8. With 247 valid responses, the dataset exceeded both thresholds, confirming its suitability for robust structural equation modelling and reliable inference of causal relationships.

Data analysis and results

Background information of the respondents

The demographic profile of the 247 valid respondents is summarized in Table 3. The majority were female (63.2%), with male respondents representing 35.6%, two participants preferring not to indicate their gender, and one identifying as non-binary. Age distribution was diverse: under 20 years (6.9%), 20–24 years (28.7%), 25–29 years (23.5%), 30–39 years (22.7%), and 40 years and above (18.2%).

Respondents were almost evenly split between undergraduate (N=130) and postgraduate (N=117) programs. Undergraduate students were distributed across academic years as follows: first year (13.4%), second year (9.3%), third year (8.9%), and fourth year (21.1%).

Participants were enrolled in a variety of disciplines, including geography (47.4%), art (16.2%), and social sciences (8.9%), attending institutions such as Universidade Estadual do Maranhão (55.9%), Universidade Federal do Maranhão (15.4%), and Universidade Federal do Rio de Janeiro (10.1%), among others.

The background data indicate that respondents possess relevant academic knowledge and experience, making them well-positioned to provide informed perspectives on the factors contributing to VAWG in Brazilian higher education.

Causes of violence against women and girls

Violence against women and girls (VAWG) in Brazilian higher education reflects deeply rooted social, economic, cultural, and institutional inequalities. Rather than serving as safe environments for intellectual and personal development, universities often replicate patriarchal systems that sustain gender-based violence [11]. The persistence of VAWG arises from a complex interplay of factors - ranging from individual vulnerabilities to structural injustices - that reinforce women's subordination and limit access to justice.

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Interpersonal and household dynamics. Economic stress and poverty often act as catalysts for household violence, with women in low-income families disproportionately affected [2,23]. Patriarchal norms reinforce male dominance and normalize coercive control [24]. Early and forced marriages exacerbate women's powerlessness and limit autonomy [25]. Shifting gender roles - such as women's increased participation in education and the workforce - can trigger insecurity among men accustomed to traditional hierarchies, resulting in retaliatory violence [9,26]. Educational disparities between partners often heighten these tensions [2], while unequal power dynamics foster controlling behaviours that restrict women's freedom and decision-making [33].

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A summary of the causal factors of VAWG identified in the literature is presented in (Table 3). Factor analysis

The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity were computed to assess the suitability of the dataset for factor analysis (Table 4). The KMO value of 0.908 indicates excellent sampling adequacy, suggesting that 90.8% of the variance in the dataset is suitable for factor extraction. Bartlett's Test yielded a chi-square

Table 3: background information of respondents.

Background information	Items	Frequency	Percentage
Gender	Male	88	35.6
	Female	156	63.2
	Prefer not to say	2	0.8
	Non-binary	1	0.4
Age	Less than 20 years	17	6.9
	20-24 years	71	28.7
	25-29 years	58	23.5
	30-39 years	56	22.7
	40 years and above	45	18.2
Year of study	First year	33	13.4
	Second year	23	9.3
	Third year	22	8.9
	Fourth year	52	21.1
	Postgraduate	117	47.4
City	Saint Louis	163	66.0
	Rio de Janeiro	26	10.5
	Imperatriz	16	6.5
	Saint Louis Maranhão	27	10.9
	Campinas São Paulo	15	6.1
Course of study	Economics	11	4.5
	Geography	117	47.4
	Meteorology	10	4.0
	Biological science	7	2.8
	History	5	2.0
	Design	6	2.4
	Agroecology	4	1.6
	Social sciences	22	8.9
	Art	40	16.2
	Medicine	2	.8
Universities	Universidade Estadual do Maranhão	138	55.9
	Universidade Federal do Maranhão	38	15.4
	Universidade Estadual de Campinas	15	6.1
	Universidade Estadual da Região Tocantina do Maranhão.	13	5.3
	Universidade Federal do Rio de Janeiro	25	10.1
	Faculdade Laboro	3	1.2
	Centro Universitário Santa Terezinha	4	1.6
	Faculdade Atenas Maranhense	11	4.5
	Psychology	5	2.0
	Physical education	9	3.6
	Engineering	9	3.6

Table 4: KMO and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.908
Bartlett's Test of Sphericity	Approx. Chi-Square	3680.945
	df	276
	Sig.	0

value of 3680.945 with 276 degrees of freedom (df) and a p-value < 0.05, confirming that the correlation matrix is not an identity matrix and that the variables are significantly correlated at the 5% level.

These results indicate that exploratory factor analysis (EFA) is appropriate for identifying and grouping the underlying causal factors of VAWG in Brazilian higher education. The strong KMO and significant Bartlett's Test support the robustness of the factor structure and justify proceeding with factor extraction and rotation to reveal latent constructs.

The variables were analysed using Promax rotation with an eigenvalue cut-off of one. Promax rotation was selected because it is well-suited for identifying underlying relationships between variables and the extracted factors, facilitating interpretation through correlations among variables and factors. A factor loading threshold of 0.40 was used to determine meaningful groupings of variables.

In this study, six variables - low education (IUC3), child, early, and forced marriage (TUC4), wife inheritance (CUC4), lack of female representation in the security sector (UUC1), suppressed civil society (UUC2), and use of rape as a weapon of war (UUC4) - were found to cross-load across multiple factors. These variables were removed, and the analysis was re-run to ensure a clear factor structure.

The final analysis, presented in (Table 5), identifies 24 critical causal factors of VAWG, grouped into individual, interpersonal, community, institutional, and societal causal categories. The resulting factor structure aligns with previous research [2,23], supporting the reliability of the analysis and the generalizability of the identified factors.

(Table 6) presents the structure matrix of the 24 critical causal factors of VAWG. All community-level factors showed correlations with the other four causal groups, highlighting their interconnected influence. Within the individual factors, only socio-demographic characteristics (IUC1) and experience of violence during childhood (IUC4) demonstrated interactions with other factors. Among the

Table 5: Pattern matrix.

	Factor				
	1	2	3	4	5
IUC1—Socio-demographic			0.587		
IUC2—Alcohol and drug abuse			0.622		
IUC4—Experience of violence during childhood			0.792		
IUC5—Mental health and disabilities; personality disorder			0.732		
IUC6—Displacement, separation from family, and female headed households			0.486		
IUC7—Witnessing mother being beaten			0.541		
TUC1—Stress and poverty / Economic stress		0.637			
TUC2—Conflict or dissatisfaction in relationship		0.49			
TUC3—Male dominance in the family		0.66			
TUC5—Unequal power and controlling behaviours		0.561			
TUC6—Changing gender roles due to conflict and displacement		0.791			
TUC7—Disparity in education attainment		0.967			
CUC1—Normalization of VAWG				0.734	
CUC2—Opportunistic rape				0.875	
CUC3—Community violence targeting women				0.906	
CUC5—Weak community sanction against VAWG				0.663	
UUC3—Abuse of power by humanitarians					0.633
UUC5—Forced enlistment/abduction of women and girls					0.714
UUC6—Lack of attention to VAWG in peace agreement and state-building					0.703
SUC1—Culture of impunity	0.813				
SUC2—Unequal gender dynamics	0.921				
SUC3—Patriarchal norms and practices	0.926				

Table 6: Structure matrix.

	Factor				
	1	2	3	4	5
IUC1—Socio-demographic	0.381	0.447	0.652	0.415	0.371
IUC2—Alcohol and drug abuse		0.362	0.642	0.446	0.402
IUC4—Experience of violence during childhood	0.309	0.525	0.792	0.444	0.333
IUC5—Mental health and disabilities; personality disorder		0.37	0.644		
IUC6—Displacement, separation from family, and female headed households		0.474	0.567	0.343	
IUC7—Witnessing mother being beaten		0.57	0.711	0.453	0.509
TUC1—Stress and poverty / Economic stress		0.636	0.44	0.324	
TUC2—Conflict or dissatisfaction in relationship	0.324	0.671	0.57	0.486	
TUC3—Male dominance in the family	0.33	0.695	0.448	0.446	0.361
TUC5—Unequal power and controlling behaviours	0.415	0.751	0.592	0.574	0.405
TUC6—Changing gender roles due to conflict and displacement		0.825	0.572	0.468	0.442
TUC7—Disparity in education attainment		0.841	0.433	0.453	
CUC1—Normalization of VAWG	0.5	0.497	0.477	0.794	0.414
CUC2—Opportunistic rape	0.358	0.454	0.455	0.844	0.506
CUC3—Community violence targeting women	0.376	0.534	0.54	0.897	0.481
CUC5—Weak community sanction against VAWG	0.408	0.461	0.403	0.729	0.466
UUC3—Abuse of power by humanitarians	0.449	0.399	0.327	0.423	0.699
UUC5—Forced enlistment/abduction of women and girls	0.424	0.342	0.454	0.458	0.768
UUC6—Lack of attention to VAWG in peace agreement and state-building	0.535		0.345	0.49	0.786
SUC1—Culture of impunity	0.805			0.418	0.397
SUC2—Unequal gender dynamics	0.912	0.305	0.334	0.413	0.487
SUC3—Patriarchal norms and practices	0.898	0.381	0.324	0.399	0.439
SUC4—Lack of rule of law	0.833			0.436	0.532
SUC5—Emphasis on hyper masculinities.	0.707	0.326	0.311	0.411	0.516

interpersonal factors, TUC2, TUC3, and TUC5 were correlated with multiple causal groups.

At the institutional level, abuse of power by humanitarian actors (UUC3) and forced enlistment/abduction of women and girls (UUC5) were linked with other factors. Within the societal factors, unequal gender dynamics (SUC2), patriarchal norms and practices (SUC3), and emphasis on hyper-masculinity (SUC5) were associated with multiple causal groups.

These inter-correlations indicate that the causal factors of VAWG are highly intertwined, reflecting complex group and structural dynamics that operate across individual, relational, institutional, and societal levels. The findings underscore the need for multi-level

interventions to address VAWG effectively within Brazilian higher education.

Measurement model

The measurement model was evaluated to assess the convergent validity, discriminant validity, and internal consistency of the constructs. Cronbach's alpha was used to assess internal consistency, with all constructs exceeding the recommended threshold of 0.7: individual causal factors (0.826), interpersonal (0.877), community (0.886), institutional (0.794), and societal (0.918) (Table 7). These values indicate strong reliability of the constructs.

Convergent validity was assessed using outer loadings and average variance extracted (AVE). All AVE values exceeded the 0.5 benchmark, confirming that the constructs adequately explain the variance of their indicators. Outer loadings ranged from 0.635 (IUC6) to 0.916 (SUC2) Table 7, meeting minimum standards and further supporting convergent validity.

Overall, the measurement model demonstrates that the constructs are both reliable and valid, providing a robust foundation for subsequent structural model analysis to examine the causal relationships among factors contributing to VAWG in Brazilian higher education.

Discriminant validity was assessed using the Heterotrait-Monotrait (HTMT) ratio, the Fornell-Larcker criterion, and cross-loadings to ensure that each construct is empirically distinct from the others (Tables 8–10). The HTMT values were all below the recommended threshold of 0.85 Table 8, indicating adequate discriminant validity. According to the Fornell-Larcker criterion, the square root of the AVE for each construct (top diagonal values) exceeded the correlations with other constructs (off-diagonal values)-Table 9, further confirming construct distinctiveness. Additionally, cross-loading analysis demonstrated that each observed variable had its highest loading on its respective construct Table 10, supporting the uniqueness of each construct. Collectively, these results confirm that the discriminant validity of the constructs was successfully established, ensuring that the measurement model reliably differentiates between the five causal categories of VAWG.

Discussion

The findings from the PLS-SEM model highlight that individual-level factors significantly influence the prevalence of VAWG in Brazilian higher education ($\beta = 0.240$, $f^2 = 3.480$) (Table11). Critical variables, including socio-demographic characteristics, alcohol and drug use, and past exposure to violence (IUC1, IUC2, IUC4–IUC7),

Table 7: Evaluation of measurement model.

Construct	Code	Outer loading	Cronbach's alpha	Composite reliability	AVE
	IUC1 IUC2 IUC4 IUC5 IUC6 IUC7	0.738 0.725 0.825 0.680 0.635 0.779	0.826	0.838	0.537
	TUC1 TUC2 TUC3 TUC5 TUC6 TUC7	0.700 0.751 0.771 0.825 0.841 0.824	0.877	0.883	0.619
Community causal factor	CUC1 CUC2 CUC3 CUC5	0.859 0.871 0.902 0.821	0.886	0.889	0.747
Institutional causal factor	UUC3 UUC5 UUC6	0.817 0.847 0.861	0.794	0.794	0.709
	SUC1 SUC2 SUC3 SUC4 SUC5	0.837 0.916 0.902 0.880 0.805	0.918	0.92	0.755

Table 8: Heterotrait-monotrait ratio (HTMT) results.

Construct	CUC	IUC	UUC	TUC	SUC
CUC					
IUC	0.609				
UUC	0.631	0.546			
TUC	0.64	0.732	0.493		
SUC	0.52	0.388	0.663	0.417	

Table 9: Fornell-Larcker criterion.

Construct	CUC	IUC	UUC	TUC	SUC
CUC					
IUC	0.864				
UUC	0.529	0.733			
TUC	0.528	0.455	0.842		
SUC	0.571	0.631	0.417	0.787	

Table 10: Cross-loading.

	Individual causal factors	Interpersonal causal factors	Community causal factors	Institutional causal factors	societal causal factors
IUC1	0.738	0.462	0.396	0.368	0.364
IUC2	0.725	0.379	0.426	0.387	0.27
IUC4	0.825	0.529	0.43	0.315	0.3
IUC5	0.68	0.369	0.279	0.26	0.196
IUC6	0.635	0.454	0.33	0.159	0.126
IUC7	0.779	0.56	0.434	0.456	0.23
TUC1	0.421	0.7	0.315	0.23	0.23
TUC2	0.529	0.751	0.468	0.278	0.319
TUC3	0.449	0.771	0.427	0.351	0.317
TUC5	0.564	0.825	0.555	0.387	0.407
TUC6	0.562	0.841	0.451	0.404	0.283
TUC7	0.433	0.824	0.447	0.29	0.212
CUC1	0.467	0.497	0.859	0.419	0.484
CUC2	0.439	0.468	0.871	0.482	0.363
CUC3	0.518	0.543	0.902	0.464	0.377
CUC5	0.397	0.462	0.821	0.464	0.394
UUC2	0.345	0.388	0.42	0.817	0.458
UUC5	0.445	0.36	0.437	0.847	0.44
UUC6	0.358	0.305	0.477	0.861	0.533
SUC1	0.275	0.287	0.402	0.429	0.837
SUC2	0.318	0.335	0.402	0.512	0.916
SUC3	0.313	0.396	0.397	0.466	0.902
SUC4	0.281	0.308	0.427	0.539	0.88
SUC5	0.314	0.32	0.406	0.511	0.805

Table 11: Hypothesis testing.

Construct	Std Beta	Std error	T-value	P-value	Decision	f2	VIF
IUC à VAWG causal factors	0.24	0.02	12.043	0	Supported	3.48	1.854
TUC à VAWG causal factors	0.312	0.021	14.522	0	Supported	5.61	1.932
CUC à VAWG causal factors	0.249	0.017	14.792	0	Supported	3.712	1.863
UUC à VAWG causal factors	0.241	0.015	15.852	0	Supported	3.652	1.772
SUC à VAWG causal factors	0.251	0.018	13.774	0	Supported	4.45	1.579
$R^2 = 0.991$							

shape vulnerability within university settings. While individual factors have the smallest path coefficient among the five causal groups, they remain pivotal in understanding how personal histories and conditions contribute to campus violence. Students from low-income families, marginalized ethnic groups, or those with childhood exposure to domestic abuse are at higher risk of experiencing or normalizing VAWG. These findings align with studies in South Africa, Nigeria, and the Philippines, which link socio-economic stress, substance abuse, and prior trauma to university-level gender-based violence [34-36]. The results underscore the need for integrated personal counselling and preventive education in higher education institutions.

Interpersonal factors exert the strongest influence on VAWG ($\beta = 0.312$, $f^2 = 5.610$; Table 11). Family and peer dynamics, economic stress, and romantic relationship tensions create conditions that escalate violence on campuses. Unequal power relations between students, or between staff and students, further contribute to harassment and abuse. Similar patterns have been observed in India and Kenya, where financial pressures and educational disparities exacerbate controlling behaviours and interpersonal violence [37, 38].

Community factors also play a critical role ($\beta = 0.249$), particularly when campus culture normalizes aggressive or harassing behaviors. Peer norms, unsupervised social events, and prioritization of institutional reputation over justice perpetuate cycles of abuse. Comparable trends are reported internationally, including in India, Mexico, and Uganda, where community tolerance of violence undermines women's educational experiences [39-41].

Institutional factors ($\beta = 0.241$) highlight the role of organizational structures and policies. Abuse of authority, lack of enforcement of protective measures, and neglect of VAWG in governance or peacebuilding frameworks exacerbate campus vulnerability. These patterns mirror findings from Ghana, Nigeria, and Rwanda, where institutional failures allow harassment and exploitation to persist [42,26].

Finally, societal factors are crucial determinants ($\beta = 0.251$, $f^2 = 4.450$), reflecting broader cultural and structural inequalities. Patriarchal norms, hyper-masculinity, unequal gender representation, and weak legal frameworks perpetuate impunity and marginalization of women on campus. The consistent significance of these factors, without cross-loading in the analysis, underscores their centrality in shaping VAWG dynamics. Similar societal influences are documented in Afghanistan, Saudi Arabia, and Turkey, highlighting the global relevance of structural and cultural determinants in higher education contexts [43-57].

Collectively, the results demonstrate that VAWG in Brazilian higher education is multi-dimensional, arising from interrelated individual, interpersonal, community, institutional, and societal factors. Effective interventions must therefore adopt integrated, multi-level strategies to promote campus safety, support survivors, and challenge systemic gender inequalities.

Recommendations

Based on the findings, this study provides multi-level recommendations to address the root causes of VAWG in Brazilian universities.

Individual-level interventions: Female students' vulnerability is often linked to childhood trauma, mental health challenges, substance use, and past experiences of violence. Universities should establish confidential, easily accessible psychological support services offering counselling, therapy, and substance abuse programs. Peer mentoring initiatives, where trained students provide emotional support and mental health guidance, can complement professional services. Educational campaigns promoting healthy relationships, effective communication, and emotional regulation are essential to build resilience and awareness.

Interpersonal-level interventions: Economic stress, relational conflict, and power imbalances contribute to campus violence. Universities should integrate relationship education into orientations and community programs, emphasizing consent, respect, and non-violent conflict resolution. Financial support mechanisms - such as scholarships, job placement assistance, and financial counselling - can reduce stress-related triggers. Student-led gender equity clubs and initiatives can foster inclusive dialogue, challenge traditional power dynamics, and promote mutual respect across genders.

Community-level interventions: Campus cultures that tolerate or overlook violence exacerbate risks. Institutions must enforce a zero-tolerance policy for harassment, assault, and intimidation. Staff, faculty, and student leaders should receive training on recognizing, reporting, and responding to incidents of VAWG. Safety measures including improved lighting, security patrols, and surveillance should be prioritized in high-risk areas to protect students. Institutional-level interventions: Universities should enhance female representation in leadership and decision-making bodies. Safe and anonymous reporting mechanisms must be established, alongside swift, fair, and victim-centered investigations. Regular training for staff on gender sensitivity, trauma-informed care, and ethical conduct is crucial to prevent abuse of authority. Policies and procedures should be transparent and consistently enforced to reinforce accountability.

Societal-level interventions: Patriarchal norms, gender inequities, and impunity continue to influence campus life. Universities can lead cultural change by embedding gender studies, human rights education, and ethics into curricula, promoting respectful masculinities, shared leadership, and diversity. Collaboration with legal authorities, NGOs, and local governments can strengthen law enforcement, accountability, and broader societal impact.

By addressing VAWG through integrated, multi-level strategies, universities can foster safer, more inclusive environments that support students' well-being, challenge systemic gender inequalities, and promote sustainable cultural change.

Conclusion

This study explored the underlying causes of violence against women and girls (VAWG) within Brazilian higher education institutions, aiming to understand how individual, interpersonal, community, institutional, and societal factors contribute to campus violence and interact with the overall causal framework. A quantitative approach was employed, with questionnaires distributed to undergraduate and postgraduate students across multiple universities and gender identities. Data were analyzed using Promax rotation to classify variables into appropriate constructs, while pattern and structural matrices examined correlations between variables and factors. Partial Least Squares Structural Equation Modelling (PLS-SEM) was subsequently used to assess the relationships among the five causal dimensions and the total causal factors of VAWG.

The findings highlight that all five constructs - individual (β=0.240), interpersonal (β=0.312), community (β=0.249), institutional (β=0.241), and societal (β=0.251) - significantly influence VAWG. Community causal factors, in particular, were highly interconnected with other causal dimensions, emphasizing the role of communal and societal contexts in sustaining campus violence. Societal factors, including patriarchal norms, unequal gender dynamics, hyper-masculinity, lack of rule of law, and cultures of impunity, were confirmed as critical contributors, with no cross-loading observed, further validating their importance. Overall, the results suggest that VAWG in Brazilian universities is deeply embedded in interrelated social, institutional, and cultural structures.

Based on these insights, practical recommendations were proposed to address VAWG comprehensively. These include expanding mental health and trauma support services, implementing ongoing education on gender equality and healthy relationships, enhancing reporting systems, increasing female representation in leadership and campus security, and revising institutional policies to actively challenge and prevent violence. Additionally, fostering a campus culture that resists norms tolerating abuse is essential for sustainable change.

While this study achieved its objectives, several limitations present opportunities for future research. Staff and faculty perspectives should be included to provide a more complete understanding of institutional dynamics. Further exploration of community and societal factors could identify additional constructs contributing to VAWG. Employing mixed-methods approaches would allow deeper qualitative insights into context-specific factors, while nationwide surveys could help generalize findings across Brazilian higher education institutions. Future research might also examine emerging forms of VAWG, such as online harassment or discrimination based on gender identity, and evaluate the effectiveness of current university policies and student-led initiatives in promoting campus safety.

Ultimately, this study provides robust empirical evidence on the complex, multi-level drivers of VAWG in Brazilian universities and offers actionable recommendations for policymakers, educators, and administrators. By addressing both individual and systemic factors, higher education institutions can create safer, more inclusive environments that promote gender equality and protect the rights and well-being of all students.

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Conflicts of Interest

The authors declare no conflicts of interest.

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