Research Articles **Open Access**

Gender Paradox in Psychological Dating Violence in Indonesian Urban Adolescents: A Differential Item Functioning Analysis

Suci Musvita Ayu[1*], Erni Gustina[2], Teti Lisdiyanti[3], Ardyawati Wira Oktaviana[4], Zulva Ferdiana Kulsum[5], Moh. Irma Sukarelawan[6], Liena Sofiana[7]

[1]Department of Public Health, Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia
[2]Department of Public Health, Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia
[3]Department of Public Health, Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia
[4]Department of Public Health, Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia
[5]Department of Public Health, Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia
[6]Physics Education Study Program, Faculty of Teacher Training and Education, Universitas Ahmad Dahlan, Indonesia
[7]Department of Public Health, Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia

*Corresponding Author: E-mail: suci.ayu@ikm.uad.ac.id

ARTICLE INFO	ABSTRACT
	Introduction: The gender paradox can be described as when violence against boys is considered minor, while violence against girls is considered oppression. What are the experiences of psychological dating violence among urban adolescents in Indonesia, and how can these be evaluated using Rasch modelling? **Methods:** This study used a cross-sectional survey approach with 114 junior high school students in private schools in Yogyakarta. The instrument used was the 10-PDV. The psychological violence paradox in adolescent dating was analyzed using the Mann-Whitney U test and Differential Item Functioning (DIF). Gender paradoxes were assessed based on p-value, DIF contrast, Rasch-Welch t, and Mantel-Haenszel Prob.
	Results: The results of the study indicate the normalization of unhealthy behavior among urban adolescents in dating relationships, with a prevalence of psychological violence exceeding 50%. On the one hand, the percentage of female adolescents reporting psychological violence was higher than that of male adolescents. On the other hand, adolescent boys reported experiencing psychological violence with a higher severity level compared to adolescent girls. **Conclusion:** These findings indicate a gender paradox in urban adolescent psychological dating violence.

INTRODUCTION

Adolescent Dating Violence (ADV) is a social issue that has gained increasing attention in the last decade (1–5). This phenomenon can be physical, sexual, economic, or psychological violence (6–8). Among these various forms of violence, Psychological Dating Violence (PDV) is the most common but least recognized, despite its serious impact on adolescents' mental health (9–11). PDV often serves as the precursor to more severe physical violence (12), making early intervention crucial.

Exposure to psychological violence during early adolescence, particularly among junior high school students, can disrupt psychosocial development. Research indicates that such experiences are associated with internalizing symptoms such as anxiety, depression, PTSD, social withdrawal, and self-esteem disorders (13–15). Even perpetrators exhibit similar psychological disturbances, indicating a reciprocal relationship in violent dynamics (16). If left unaddressed, these psychological impacts can persist into adulthood and affect the quality of interpersonal relationships and long-term social functioning (17). Therefore, a deeper understanding of the dynamics of adolescent psychological violence is crucial for designing targeted interventions.

One important dimension that needs further examination is the gender paradox in experiences of psychological dating violence. In general, adolescent girls are reported to experience more severe psychological effects, such as depression and PTSD, than adolescent boys (18,19). This reinforces the social construct that positions girls as the primary victims, while boys are often seen as the perpetrators (20,21). However, empirical evidence shows that girls and boys can be victims or perpetrators, with different motivations and impacts (22,23). Girls are generally more open in expressing their experiences of violence, while girls often suppress their emotions due to the pressure of masculine norms. This paradox becomes more complex among urban adolescents, where gender equality values are growing stronger, yet disparities in subjective well-being persist (8,24).

To understand the gender paradox in psychological dating violence, it is important to consider broader theoretical frameworks such as intersectionality and masculinity studies. The intersectional perspective emphasizes how overlapping social identities interact to shape adolescents' vulnerability to violence and their responses to it (25–27). For example, urban adolescents may experience conflicting pressures between progressive gender norms and traditional expectations, creating complex expressions of both victimization and perpetration. On the other hand, masculinity studies argue that dominant ideals of masculinity can hinder boys from acknowledging their victimization or seeking help (28,29). These theoretical perspectives help unravel the complex social dynamics underlying the seemingly paradoxical gender patterns in psychological dating violence.

Several recent studies have reported that adolescent boys are more likely to report being victims of psychological violence than girls (30,31). However, PDV among adolescents is bidirectional (32,33), with both parties engaging in controlling, manipulative, or verbally abusive behavior. A gender paradox emerges when boys' experiences of violence are perceived as "less severe" or not serious (34). Similar experiences among girls are viewed as forms of oppression. This not only highlights differences in perception but also reflects biases in the measurement of psychological violence.

Most instruments used to measure dating violence, such as the Conflict in Adolescent Dating Relationships Inventory (CADRI) and the Relationship Behavior Survey (RBS), do not yet accommodate the possibility of gender bias in the interpretation of items. Although the RBS begins to consider the perpetrator's intentions, such as "joking" or "protecting," this instrument has not systematically tested gender-based differences in perception (35). However, perceptions of PDV are greatly influenced by social norms and gender roles (36,37). Boys sometimes view controlling behavior as a normal form of care (35).

For this reason, the Rasch model approach with Differential Item Functioning (DIF) analysis offers a more objective methodological solution. The Rasch model allows for evaluating the extent to which an individual's response to an item reflects their actual experience level. At the same time, DIF can identify biases in interpretation between gender groups (38). This approach is important when the instrument being used needs to be tested for fairness across all genders.

The lack of literature is also evident in the local context. Most previous studies have focused on Western countries or Latin America (30,31,35) and Europe (39,40). While the dynamics of adolescent urban psychological violence in Southeast Asia, particularly Indonesia, remain under-explored. Indonesian urban adolescents have unique characteristics, such as high intensity of social media use, high academic pressure, and exposure to popular culture

that often romanticizes possessive behavior. These factors have the potential to exacerbate or moderate experiences of violence, but have not been extensively studied in relation to gender bias and adolescents' perceptions of psychological violence.

This study aims to explore the experiences of urban adolescents about PDV in Indonesia and to test the gender paradox in the measurement of these experiences using the Rasch model approach and DIF analysis. The novelty of this study lies in the application of quantitative methods that can reveal perceptual biases in the interpretation of violence, as well as provide a scientific basis for the development of more gender-inclusive instruments and prevention interventions. Thus, this study not only fills existing methodological gaps but also contributes practically to efforts to prevent adolescents' urban dating violence.

METHOD
Research Type and Sample
This study is a quantitative study with a cross-sectional approach. A survey on adolescent PDV was conducted in three private junior high schools in Yogyakarta City. The respondents involved were 114 students, consisting of 50 boys and 64 girls, who were in grades VII and VIII. The average age of the respondents was 13.27 years, with a standard deviation of 0.73 years. The number of respondents met the assumption of sample size adequacy based on stability ±½ logit with a 95% confidence level (41). Respondents were selected using purposive sampling techniques and based on inclusion and exclusion criteria. Inclusion criteria included adolescents in junior high school who were in a romantic relationship. Exclusion criteria included students from public schools and schools outside the Yogyakarta City area.

Instrumentation and Data Collection Procedures
The instrument used in this study was the Psychological Dating Violence (10-PDV) Scale, which consists of 10 items. This Scale aims to measure the level of psychological dating violence. The instrument was distributed directly to respondents as a paper-and-pencil test. Before collecting data, the researchers coordinated with the guidance and counseling teachers and obtained approval from the school. This was done to ensure that the research process was conducted according to the regulations applicable to the school environment. Data was collected during Guidance and Counseling class time, with each respondent allocated 15 to 20 minutes to complete the instrument. Participation in this study was voluntary, so respondents participated without coercion or pressure from any party.

Data Analysis
Data on PDV were analyzed using the Rasch model. The software used was Microsoft Excel and Winstep 4.6.1. Microsoft Excel was used to prepare the raw data, which was then analyzed using Winstep. Before analysis, the 10-PDV Scale was evaluated for psychometric properties using the Outfit MnSq, Outfit ZStd, Point Measure Correlation (Pt. Mea. Corr), item reliability, and Cronbach's Alpha. The Outfit MnSq, Outfit ZStd, and Pt. Mea. Corr. were used to test the Scale's fit to the Rasch model (42), while item reliability and Cronbach's alpha were used to assess the internal consistency of the 10-PDV Scale (43–45). The 10-PDV Scale is considered to fit the Rasch model if the Oufit MnSq value is 0.50–1.50, ZStd ranges from –2.00 to +2.00, and Pt. Mea. Corr. is within the range of 0.40–0.80 (42,46,47). This Scale is considered reliable if it has a reliability value of more than 0.70 (48). Data on PDV were also analyzed descriptively to obtain a general picture of the incidents that occurred. The Logit Value of Person (LVP) technique was used to evaluate the prevalence of victims of PDV, while the Logit Value of Item (LVI) was used to identify the forms of violence experienced by adolescents. Gender paradox analysis in psychological violence experiences was conducted using the Mann-Whitney U test combined with Differential Item Functioning (DIF) analysis. The combination of these two techniques allows for the identification of gender paradoxes in experiences of PDV.

RESULTS

Psychometric properties of the 10-PDV Scale

The psychometric properties of the 10-PDV Scale based on the Rasch model are summarized in Table 1.

Table 1. The psychometric properties of the 10-PDV Scale

Statement	Measure (logit)	Infit		Outfit		Pt. Mea. Corr.	Item status
		MnSQ	ZStd	MnSQ	ZStd		
KEm1. My partner often looks upset and glares at me.	-0.02	1.42	2.13	1.67	2.03	0.38	Marginal Fit
KEm2. My partner forbids me from hanging out with friends of the opposite sex.	-0.91	1.05	0.46	1.01	0.13	0.61	Fit
KEm3. My partner forces me to read my messages without permission.	1.14	0.99	0.06	0.98	0.15	0.40	Fit
KEm4. My partner is overly protective of me, making me feel uncomfortable.	0.48	1.03	0.22	0.93	-0.05	0.47	Fit
KEm5. My partner restricts my freedom too much.	2.26	0.81	-0.22	0.41	-0.45	0.36	Marginal Fit
KEm6. My partner often accuses me of hanging out with friends of the opposite sex without a clear reason.	0.34	0.89	-0.48	1.15	0.53	0.52	Fit
KEm7. My partner constantly asks me where I am going and who I am with.	-0.63	0.88	-0.87	0.75	-1.25	0.65	Fit
KEm8. My partner often feels jealous without any clear reason.	-0.54	0.81	-1.35	0.70	-1.46	0.66	Fit
KEm9. My partner tells me that I am his property.	-2.46	1.05	0.43	0.89	-0.24	0.75	Fit
KEm10. My partner often controls what I do and asks too many questions about my activities.	0.34	0.97	-0.05	0.94	-0.06	0.51	Fit
Instrument Reliability (Cronbach's Alpha)				0.75			Reliable
Item Reliability				0.89			Reliable
Item Separation				2.86			
Item Mean				0.00			
Item Std Dev.				1.27			

Source: Primary Data

Based on Table 1, the suitability of items in the 10-PDV was evaluated based on the Outfit MnSq, Outfit ZStd, and Pt. Mea. Corr. The Outfit MnSq values ranged from 0.41 to 1.67, and the Outfit ZStd values ranged from -1.46 to 2.03. Meanwhile, the Pt. Mea. Corr. values range from 0.36 to 0.75. Based on the established criteria, 8 out of 10 items (80%) have a good fit with the Rasch model. Meanwhile, two items (KEm1 and KEm5) exhibit marginal fit to Rasch model expectations. Items KEm1 and KEm5 were retained in the 10-PDV scale because Pt. Mea. Corr. both items showed polarity in the same direction as the construct in PDV (46,49). The items' reliability and the instrument's reliability have indices of 0.89 and 0.75, respectively. Both reliability indices indicate that the 10-PDV scale is reliable.

Urban adolescent psychological dating violence

Descriptive statistics on incidents of violence among dating adolescents in urban areas are visualized in Figure 1.
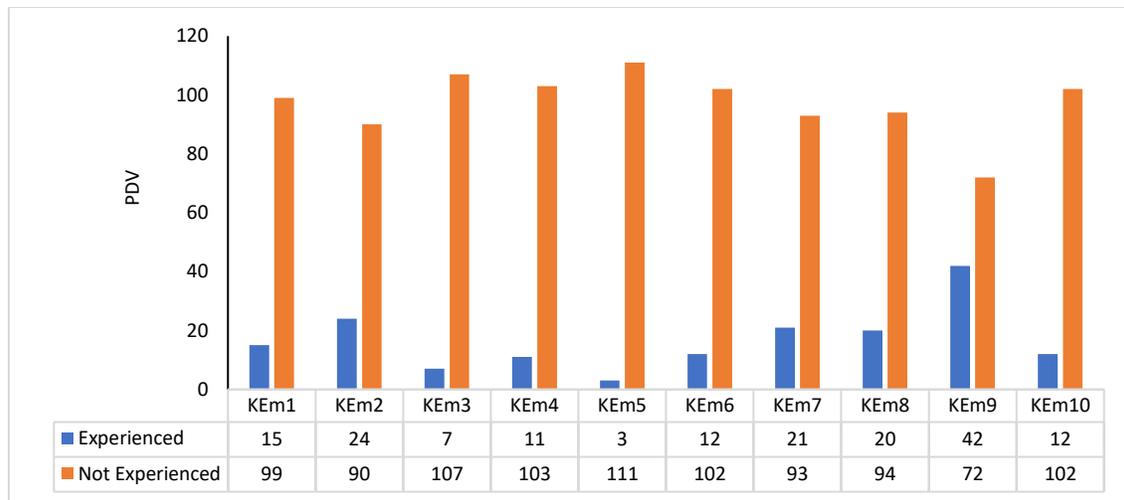
Figure 1. Descriptive statistics of urban adolescents' PDV

Figure 1 shows descriptive statistics on incidents of urban adolescent psychological dating violence. Of the 114 adolescents in relationships, 54 (47.4%) did not experience violence, while 60 (52.6%) experienced psychological dating violence. Among all respondents, the form of psychological dating violence KEm9, "My partner tells me that I am his property," was the most commonly experienced by urban adolescents. Meanwhile, the form of psychological violence, KEm5, "My partner restricts my freedom too much," was the least commonly experienced among the 10 forms of psychological violence identified. The prevalence of psychological dating violence victims based on the LVP is tabulated in Table 2.

Table 2. Prevalence of psychological dating violence victims

Logit Value of Person	Category	Percentage
LVP ≥ -0.18	Very High	13.3%
-1.36 ≤ LVP < -0.18	High	33.3%
-2.54 ≤ LVP < -1.36	Medium	26.7%
LVP < -2.54	Low	26.7%

Based on Rasch model analysis, the mean and standard deviation of person scores were -1.36 and 1.18 logits, respectively. According to Table 2, urban adolescent psychological dating violence had the highest prevalence rate in the high category, at 33.3%. The prevalence of psychological violence victims in the Medium and Low categories is 26.7% each. Meanwhile, the lowest prevalence of psychological violence victims, at 13.3%, is in the Very High category. The categorization of forms of psychological violence experienced by adolescents in urban areas is tabulated in Table 3.

Table 3. Forms of PDV are experienced by adolescents in urban areas who are in relationships

Logit Value of item	Category	Items
LVI ≥ 1.27	Very High	KEm5
0.00 ≤ LVI < 1.27	High	KEm3, KEm4, KEm6, KEm10
-1.27 ≤ LVI < 0.00	Medium	KEm1, KEm8, KEm7, KEm2
LVI < -1.27	Low	KEm9

Based on Rasch model analysis, each item's mean and standard deviation were 0.00 and 1.27 logits, respectively. According to Table 3, only one item (10%) (KEm5) of PDV was in the very high category. Four items (40%) (KEm3, KEm4, KEm6, KEm10) fall into the high category. Four items (40%) (KEm1, KEm8, KEm7, KEm2) are in the medium category, and one item (10%) (KEm9) falls into the low category.

A detailed analysis was conducted using a Wright map (see Appendix 1). Appendix 1 maps the categorization of forms of adolescent urban PDV against the probability of prevalence of PDV victims. Appendix 1 shows that 16 out of 60 adolescents (26.7%) who reported experiencing psychological violence had a probability of less than 50% of experiencing psychological violence.

The gender paradox in the experience of adolescent urban psychological dating violence

Table 4 summarizes the results of the analysis of differences in urban adolescent PDV victims based on gender.

Table 4. Urban adolescent psychological dating violence victims based on gender

	Gender		
	Boys	**Girls**	**Total**
Descriptive			
N	27 (45%)	33 (55%)	60 (100%)
Mean	-1.24 logit	-1.46 logit	-1.36 logit
Minimum	-2.72 logit	-2.72 logit	-2.72 logit
Maximum	1.08 logit	2.70 logit	2.70 logit
Test Statistics			
Mean Rank	32.54	28.83	
Mann-Whitney U		390.500	
Wilcoxon W		951.500	
Z		-0.839	
Asymp. Sig. (2-tailed)		0.402	

Based on Table 4, 55% of urban adolescent girls and 45% of urban adolescent boys reported experiencing psychological dating violence. The lowest logit value for girl victims was the same as that for boy victims. The highest logit value for girl victims is higher than that for boy victims. Similarly, the average logit value for girl victims is lower than the average logit value for boy victims. The results of the Mann-Whitney U test show a statistical significance value of 0.402. Statistically, there is no significant difference between the two genders. The results of the comparison of urban adolescent psychological dating violence based on gender are presented in Table 5.

Table 5. Differences in urban adolescent psychological dating violence based on gender

Item	DIF contrast	Rasch-Welch t	Mantel-Haenszel Prob.
KEm1	-0.67	-0.99	0.77
KEm2	0.50	0.83	0.55
KEm3	1.32	1.32	0.29
KEm4	-0.86	-1.13	0.72
KEm5	1.05	0.76	0.70
KEm6	0.00	0.00	0.97
KEm7	-0.48	-0.78	0.62
KEm8	-0.70	-1.12	0.19
KEm9	0.24	0.38	0.86
KEm10	1.10	1.42	0.32

Gender-based psychological dating violence differences for each form of psychological violence were evaluated using three indicators, namely: DIF contrast, Rasch-Welch t, and Mantel-Haenszel Probability. The DIF contrast values on the 10-PDV Scale ranged from -0.86 (KEm4) to 1.32 (KEm3). The Rasch-Welch t values ranged from -1.12 (KEm8) to 1.42 (KEm10). Meanwhile, the Mantel-Haenszel Probability values ranged from 0.19 (KEm8) to 0.97 (KEm6). Visually, gender-based psychological violence differences among urban adolescents for each form of psychological violence can also be evaluated using the Differential Item Functioning (DIF) graph in Appendix 2.

DISCUSSION
Psychometric properties of the 10-PDV Scale

Before use, the psychometric properties of the 10-PDV Scale were tested using the Rasch model. The Rasch model, based on modern test theory, was chosen because it produces a more accurate interval measurement scale (50), provides consistent parameter estimates (51), and is invariant (52). Additionally, the Rasch model can detect items in the 10-PDV Scale that are inappropriate or flawed, allowing the Scale to be improved to enhance its validity.

The psychometric properties of the 10-PDV Scale were evaluated using three standard criteria: Outfit MnSq (0.50–1.50), Outfit ZStd (±2), and Pt. Mea. Corr. (0.40–0.80) (53). Based on the analysis results, two items (KEm1 and KEm5) were a marginal fit with the Rasch model. Item KEm1 had Outfit MnSq, ZStd, and Pt. Mea. Corr. values slightly outside the acceptable range. Similarly, item KEm5 had Outfit MnSq and Pt. Mea. Corr. values are below the acceptable limits. However, items KEm1 and KEm5 are retained in the 10-PDV Scale because the Pt. Mea. Corr. values are positive. This indicates that the item orientation does not contradict the model expectations and continues to contribute to a coherent 10-PDV scale (54). Additionally, KEm1 is retained because the Outfit MnSq value is no more than 2.0. An Outfit MnSq value of no more than 2.0 indicates that item KEm1 does not reduce the quality of the 10-PDV Scale (55).

The reliability of the 10-PDV Scale was evaluated based on instrument and item reliability. Instrument reliability was assessed using Cronbach's alpha index. The alpha index indicates internal consistency or shows the interaction between the person and the items (42). Item reliability indicates the quality of the items in the Scale (55). A reliability index above 0.70 is acceptable (56). Therefore, the 10-PDV Scale can be used to measure incidents of psychological violence among urban adolescents in relationships.

Urban adolescent psychological dating violence

One important finding in this study is the extreme difference in the probability of occurrence between items of psychological violence. Of the ten forms of violence studied, KEm9 ("My partner tells me that I am his property") was recorded as the most common form of violence experienced by urban adolescents. Conversely, KEm5 ("My partner restricts my freedom too much") was the least frequently reported form. This disparity indicates a spectrum of psychological violence experiences, ranging from the most subtle to the most explicit.

The high incidence of KEm9 indicates that possessive behavior tends to be considered normal or even interpreted as affection by urban adolescents (57). In the context of urban adolescents, expressions of ownership over a partner are not interpreted as a form of control but rather as a symbol of emotional attachment. This reinterpretation of possessive behavior is because adolescents transition from parental attachment figures to romantic partners (58,59). This is reinforced by the influence of popular culture, such as films or stories, which often romanticize possessive behavior (60). The normalization of such mild forms of violence risks establishing the foundation for unequal relationships and paving the way for more severe forms of violence in the future.

Conversely, more explicit forms of violence, such as KEm5 (restricting freedom), tend to be rare or may be difficult for urban adolescents to recognize as victims. Restrictions on freedom by a partner represent complete control over personal autonomy and are characteristic of a dominant relationship. Adolescents who experience this form of violence may do so out of fear, discomfort, or even because they have not yet recognized the situation as violence, resulting in few cases being identified. Such behavior is extremely dangerous and can cause long-term psychological effects on victims, even more severe than physical violence (61).

Similar disparities are also reflected in the distribution of psychological dating violence prevalence categories. The highest prevalence was found in the high category at 33.3%, followed by the medium and low categories (26.7% each), while the lowest was in the very high category (13.3%). This pattern shows that most urban adolescents experience psychological dating violence at a moderate level of severity. This reflects a tolerance threshold for psychological dating violence, particularly in the context of urban adolescents, where unhealthy relationship dynamics are often viewed as a normal part of the dating process. A lack of understanding and awareness makes it difficult for adolescents to distinguish between healthy and unhealthy relationships (57).

However, it is important to note the discrepancy between reports of violence and the actual probability of occurrence, as shown by the Wright Map. A total of 26.7% of adolescents who identified themselves as victims had a probability of less than 50% of actually experiencing violence, based on logit estimates. This indicates that

perceptions of violence vary significantly among individuals, and some adolescents may label certain behaviors as violence even if they have not crossed the objective threshold. Factors such as lack of knowledge, experiential bias, or tolerance for controlling behavior may influence such reporting.

These findings confirm that educational efforts on healthy relationships need to consider both ends of the spectrum: from the mildest forms of violence that are often normalized to the most invasive forms that are difficult to recognize. Intervention programs should be designed to strengthen adolescents' awareness of the signs of psychological dating violence, both explicit and subtle, and to foster their ability to set and respect personal boundaries in relationships.

The gender paradox in urban adolescent psychological dating violence experiences

Although the percentage of urban adolescent girls who reported experiencing psychological violence in romantic relationships was higher (55%) than that of adolescent boys (45%), the results of the logit analysis showed that urban adolescent boys had a higher average logit score. This suggests that, on average, male adolescents perceive the psychological violence they experience as more severe than female adolescents. Furthermore, statistical analysis using the Mann-Whitney U test shows no significant difference between male and female adolescents in their overall experience of psychological violence in romantic relationships (p = 0.402). Therefore, from a purely statistical perspective, the prevalence and severity of psychological violence in dating relationships appear to be comparable between the two genders.

However, despite the lack of statistically significant differences, a notable pattern emerges: male adolescents report higher levels of severity in their responses. This indicates a gender paradox, where males experience psychological violence in romantic relationships in a more profound way. Although this contradicts existing social expectations. This interpretation should be approached with caution, as it reflects subjective perceptions shaped by gender norms rather than objective differences in exposure to violence. Cultural expectations lead men to interpret certain behaviors as more damaging to their self-esteem or masculinity. As found by Mustapha (62) in the Nigerian context, boys may experience various forms of psychological violence that challenge their sense of identity and emotional security. Therefore, although quantitative data do not support significant gender differences in overall exposure, the qualitative dimensions of perception and meaning-making may differ substantially. These differences highlight the importance of combining statistical analysis and socio-cultural interpretation when examining adolescents' experiences of dating violence.

Adolescent girls tend to be more open and socially trained to recognize and express forms of psychological dating violence because they have higher emotional competence, which encourages emotional expression and empathy (63). Conversely, adolescent boys generally have difficulty identifying or acknowledging that they are victims due to the social stigma (masculinity standards) attached to the position of boy victims (64). Stigma, shame, and ignorance about the definition of psychological violence can cause adolescent boys to tend to keep these experiences to themselves. Therefore, the higher average logit scores among boys—despite fewer cases—may reflect the unseen emotional burden they face in dealing with the violence they experience.

Differential Item Functioning (DIF) analysis using DIF contrast, Rasch-Welch t, and Mantel-Haenszel probability (38). The DIF analysis indicates no significant differences in item functioning between boys and girls. This means that both boy and girl adolescents in urban areas do not experience significant differences in the forms of psychological violence they encounter. Both genders are equally positioned as victims. However, this result should not be interpreted to mean that experiences of violence are entirely equivalent or similar. Instead, this may reflect the need for further development of the instrument to make it more sensitive to gender differences in violence experiences among urban adolescents.

Some forms of psychological dating violence may be more meaningful or emotionally hurtful to one gender in particular, even though they are not recorded in statistically different response patterns. For example, actions such as prohibiting interaction with friends of the opposite sex (KEm2) or overprotecting one's partner (KEm4) can have different effects on urban adolescent boys compared to girls. Prohibiting interaction with friends of the opposite sex is perceived as a violation of social autonomy and masculinity in boys. In dominant social norms, boys are considered to have greater social mobility and are more likely to be tolerated in forming cross-gender friendships (65). When their partners prohibit them, this can be felt as control that undermines their position as the "leader" of the relationship

or even be seen as socially humiliating. In the context of overprotection in relationships, adolescent boys tend to feel belittled or untrusted. They may even view such treatment as a sign of their "weakness" in the relationship because adolescent boys are often raised in a social construct that emphasizes independence, control, and the role of protector rather than being overly protected (66).

Therefore, although the Rasch model offers advantages in assessing the fairness of measurement tools, a qualitative approach or mixed methods are still needed to capture the subjective dimensions and cultural nuances of psychological dating violence experiences, particularly those not reflected in statistical data. The findings of this study underscore the importance of a more inclusive approach in programs aimed at preventing urban adolescent psychological dating violence. It is time that adolescent boys, especially those in urban areas, are recognized as a vulnerable group susceptible to psychological violence rather than merely being positioned as potential perpetrators. Educators, counselors, and healthcare workers need to be trained to recognize the signs of non-physical violence experienced by adolescent boys, which may manifest as withdrawal, anger, or decreased motivation to learn. On the other hand, the development of measurement scales also needs to consider the diversity of expressions and experiences of gender- and culture-based violence so that the results obtained are more valid and representative.

CONCLUSION

This study shows that psychological dating violence is common among urban adolescents, with a prevalence of more than 50%. Possessive behaviors, such as viewing one's partner as personal property, are the most common, while more explicit forms of violence, such as restricting freedom, are rarely reported. This indicates the normalization of unhealthy behavior in adolescent relationships. In terms of gender, although more girls report being victims, adolescent boys exhibit higher levels of violence severity based on logit analysis. However, this difference is not statistically significant, indicating that both genders are equally vulnerable, although they express and understand violence differently. These findings emphasize the importance of gender-inclusive healthy relationship education and highlight the need for refining measurement instruments to account for gender-based perception differences in psychological dating violence. The DIF analysis revealed that certain items function differently across genders, indicating potential bias in current tools. This suggests that future interventions should utilize or develop instruments that better capture the nuanced expressions of psychological violence among boys and girls in urban adolescent settings, ensuring more accurate assessment and tailored program delivery.

This study has several limitations that need to be considered. First, the single quantitative approach used was unable to fully describe adolescents' subjective experiences of psychological violence, including emotional meanings and contextual relational dynamics. Second, the study's focus on adolescents in urban areas limits the generalizability of the findings to adolescent populations in rural areas or with different cultural backgrounds. Therefore, future research is recommended to use qualitative or mixed-method approaches to delve deeper into the complexity of psychological violence experiences and expand the scope of the study to various social and geographical contexts. Further research should also examine gender differences in perceptions and impacts of psychological violence, more specifically, to support the development of more inclusive and needs-based interventions for adolescents.

AUTHOR'S CONTRIBUTION STATEMENT

Suci Musvita Ayu contributed to the conceptualization, methodology, investigation, resources, writing of the original draft, review, editing, and supervision. Erni Gustina contributed to the original draft's conceptualization, validation, data curation, and writing. Teti Lisdiyanti, Ardyawati Wira Oktaviana, and Zulva Ferdiana Kulsum contributed to data curation and project administration. Moh. Irma Sukarelawan contributed to the methodology, formal analysis, visualization, and supervision. Liena Sofiana contributed to the validation and review.

CONFLICTS OF INTEREST

Both authors declare that they have no competing interests.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

While compiling this manuscript, generative artificial intelligence (AI) tools or AI-supported technology were used. ChatGPT was used to enhance sentence quality, ensure sentence consistency, maintain coherence between sentences within paragraphs, assess the clarity and direction of the narrative flow in the manuscript, and elevate the academic standards of the language. DeepL and Grammarly were utilized to support text translation and improve grammatical clarity within the manuscript.

BIBLIOGRAPHY

1. Ayu SM, Shaluhiyah Z, Widjanarko B, Purwanti A. Why they willingly become victims of dating violence: a phenomenological study based on female adolescent perspective. Int J Public Heal Sci [Internet]. 2023 Dec 1;12(4):1508. Available from: https://ijphs.iaescore.com/index.php/IJPHS/article/view/23023

2. Barroso-Corroto E, Laredo-Aguilera JA, Cobo-Cuenca AI, Carmona-Torres JM. Experiences of nursing students who are victims of dating violence: a qualitative study. BMC Nurs [Internet]. 2024 Jan 9;23(1):28. Available from: https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-023-01688-w

3. de Moura JQ, Saratt MM, da Silva SCS, Silva VC, Murta SG, Habigzang LF. Adaptation and feasibility assessment of a dating violence prevention program for girls in foster care. Psicol Reflexão e Crítica [Internet]. 2024 Mar 14;37(1):9. Available from: https://prc.springeropen.com/articles/10.1186/s41155-024-00292-4

4. Jaureguizar J, Dosil-Santamaria M, Redondo I, Wachs S, Machimbarrena JM. Online and offline dating violence: same same, but different? Psicol Reflexão e Crítica [Internet]. 2024 Apr 11;37(1):13. Available from: https://prc.springeropen.com/articles/10.1186/s41155-024-00293-3

5. Lawrence TI, Wojciechowski TW, Allen JP, Tolentino M, Hajovsky DB. Longitudinal examination of marijuana use and physical teen dating violence: Antisocial peers and impulsivity as mediators. Child Abuse Negl [Internet]. 2024 Oct;156:107016. Available from: https://linkinghub.elsevier.com/retrieve/pii/S014521342400406X

6. Ayu SM, Gustina E, Rahfiludin MZ. Age, gender and duration of dating with the involvement in dating violence. Int J Public Heal Sci [Internet]. 2022 Dec 1;11(4):1281. Available from: https://ijphs.iaescore.com/index.php/IJPHS/article/view/21487

7. Ayu SM, Gustina E, Sofiana L, Wardani Y, Sukarelawan MI. Physical and psychological violence victimization scale in adolescents dating: Confirmatory factor analysis and Rasch model. Int J Eval Res Educ [Internet]. 2023 Mar 1;12(1):96. Available from: https://ijere.iaescore.com/index.php/IJERE/article/view/22250

8. Temple JR, Baumler E, Wood L, Franco KS, Peskin M, Shumate C. Cumulative Incidence of Physical and Sexual Dating Violence: Insights From A Long-term Longitudinal Study. J Interpers Violence [Internet]. 2024 Feb 20;39(3–4):735–55. Available from: https://journals.sagepub.com/doi/10.1177/08862605231200218

9. Ayu SM, Sofiana L, Sabrina NK. Physical and psychological violence in dating with stress among adolescents during the COVID-19 pandemic. Int J Public Heal Sci [Internet]. 2021 Sep 1;10(3):515. Available from: https://ijphs.iaescore.com/index.php/IJPHS/article/view/20764

10. Dim EE, Elabor-Idemudia P. Prevalence and Predictors of Psychological Violence Against Male Victims in Intimate Relationships in Canada. J Aggress Maltreat Trauma [Internet]. 2018 Sep 14;27(8):846–66. Available from: https://www.tandfonline.com/doi/full/10.1080/10926771.2017.1382638

11. Lund EM, Thomas KB. The Association between Physical and Psychological Domestic Violence Experienced

during the COVID-19 Pandemic and Mental Health Symptoms. Int J Environ Res Public Health [Internet]. 2023 Feb 14;20(4):3312. Available from: https://www.mdpi.com/1660-4601/20/4/3312

12. O'Leary KD. Psychological Abuse: A Variable Deserving Critical Attention in Domestic Violence. Violence Vict [Internet]. 1999 Jan 1;14(1):3–23. Available from: http://connect.springerpub.com/lookup/doi/10.1891/0886-6708.14.1.3

13. Jagasia E, Bloom I, Nelson KE, Campbell J. Early adolescent development in the face of violence: A systematic review running. Child Abuse Negl [Internet]. 2024 May;151:106751. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0145213424001340

14. Callahan MR, Tolman RM, Saunders DG. Adolescent Dating Violence Victimization and Psychological Well-Being. J Adolesc Res [Internet]. 2003 Nov 1;18(6):664–81. Available from: https://journals.sagepub.com/doi/10.1177/0743558403254784

15. Yanez-Peñúñuri LY, Rey-Anacona CA, Garcia-Estrada LI. Relationship between Dating Violence and Mental Health of Young Victims and Perpetrators: A Systematic Review. Int J Psychol Res [Internet]. 2023 May 18;16(1):126–39. Available from: https://revistas.usb.edu.co/index.php/IJPR/article/view/5710

16. MacDonald KE. The relationship between different dating violence profiles, mental health problems and mental well-being among Canadian youth [Internet]. University of Western Ontario; 2016. Available from: https://ir.lib.uwo.ca/etd/3667

17. Mousoulidou M, Christodoulou A, Goutoglou T. Psychosocial Development for Children and Adolescents Exhibiting Aggressive Behaviour. In 2024. p. 121–44. Available from: https://services.igi-global.com/resolvedoi/resolve.aspx?doi=10.4018/979-8-3693-4022-6.ch007

18. Kamndaya M, Pisa PT, Chersich MF, Decker MR, Olumide A, Acharya R, et al. Intersections between polyvictimisation and mental health among adolescents in five urban disadvantaged settings: the role of gender. BMC Public Health [Internet]. 2017 Jul 4;17(S3):525. Available from: http://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-017-4348-y

19. Sears HA, Byers ES. Adolescent Girls' and Boys' Experiences of Psychologically, Physically, and Sexually Aggressive Behaviors in Their Dating Relationships: Co-Occurrence and Emotional Reaction. J Aggress Maltreat Trauma [Internet]. 2010 Jul 29;19(5):517–39. Available from: http://www.tandfonline.com/doi/abs/10.1080/10926771.2010.495035

20. Harned MS. Abused Women or Abused Men? An Examination of the Context and Outcomes of Dating Violence. Violence Vict [Internet]. 2001 Jan 1;16(3):269–85. Available from: http://connect.springerpub.com/lookup/doi/10.1891/0886-6708.16.3.269

21. Schröttle M, Vogt K. Women as Victims and Perpetrators of Violence: Empirical Results from National and International Quantitative Violence Research. In: Women and Children as Victims and Offenders: Background, Prevention, Reintegration [Internet]. Cham: Springer International Publishing; 2016. p. 479–504. Available from: http://link.springer.com/10.1007/978-3-319-08398-8_18

22. Dardis CM, Edwards KM, Kelley EL, Gidycz CA. Dating Violence Perpetration: The Predictive Roles of Maternally versus Paternally Perpetrated Childhood Abuse and Subsequent Dating Violence Attitudes and Behaviors. J Aggress Maltreat Trauma [Internet]. 2013 Jan;22(1):6–25. Available from: http://www.tandfonline.com/doi/abs/10.1080/10926771.2013.743948

23. Dardis CM, Dixon KJ, Edwards KM, Turchik JA. An Examination of the Factors Related to Dating Violence Perpetration Among Young Men and Women and Associated Theoretical Explanations. Trauma, Violence, Abus [Internet]. 2015 Apr 10;16(2):136–52. Available from: https://journals.sagepub.com/doi/10.1177/1524838013517559

24. Chandra-Mouli V, Plesons M, Amin A. Addressing harmful and unequal gender norms in early adolescence. Nat Hum Behav [Internet]. 2018 Feb 21;2(4):239–40. Available from: https://www.nature.com/articles/s41562-018-0318-3

25. Oliveira E de, Luiz O do C, Couto MT. Adolescents, poverty areas, violence, and public health: an intersectional perspective. Rev Bras Enferm [Internet]. 2022;75(suppl 2):e20190685. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672022001100207&tlng=en

26. Fix RL, Nava N, Rodriguez R. Disparities in Adolescent Dating Violence and Associated Internalizing and

Externalizing Mental Health Symptoms by Gender, Race/Ethnicity, and Sexual Orientation. J Interpers Violence [Internet]. 2022 Sep 6;37(17–18):NP15130–52. Available from: https://journals.sagepub.com/doi/10.1177/08862605521997944

27. Baird S, Camfield L, Ghimire A, Hamad BA, Jones N, Pincock K, et al. Intersectionality as a Framework for Understanding Adolescent Vulnerabilities in Low and Middle Income Countries: Expanding Our Commitment to Leave No One Behind. Eur J Dev Res [Internet]. 2021 Oct 1;33(5):1143–62. Available from: https://link.springer.com/10.1057/s41287-021-00440-x

28. Üzümçeker E. Traditional Masculinity and Men's Psychological Help-Seeking: A Meta-Analysis. Int J Psychol [Internet]. 2025 Apr 4;60(2):e70031. Available from: https://onlinelibrary.wiley.com/doi/10.1002/ijop.70031

29. Staiger T, Stiawa M, Mueller-Stierlin AS, Kilian R, Beschoner P, Gündel H, et al. Masculinity and Help-Seeking Among Men With Depression: A Qualitative Study. Front Psychiatry [Internet]. 2020 Nov 24;11:599039. Available from: https://www.frontiersin.org/articles/10.3389/fpsyt.2020.599039/full

30. Moraes CL de, Faus DP, Castro MC, Reichenheim M, Junger WL, Taquette SR. Dating violence perpetration and victimization among high schoolers from public and private schools in Rio de Janeiro, Brazil. Cad Saude Publica [Internet]. 2025;40(12):e00149923. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0102-311X2024001201402&tlng=en

31. Gabster A, Xavier Hall CD, Yu Pon A, Millender E, Wong F ("Frankie") Y, Pascale JM. Dating violence prevalence and risk factors among adolescents (14–19 years) in urban public schools in Panama. Lancet Reg Heal - Am [Internet]. 2023 Jan;17:100383. Available from: https://linkinghub.elsevier.com/retrieve/pii/S2667193X22002009

32. Paradis A, Fortin A, Van Camp T, Hébert M, Fernet M. A latent class analysis of adolescent dating violence: Associations with daily conflict management. Child Abuse Negl [Internet]. 2024 Mar;149:106619. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0145213423006075

33. Villanueva-Blasco VJ, Hernández MJ, Mitjans MT, Ejarque BI. Gender Differences and Latent Class in the Perpetration of teen Dating Violence. J Fam Violence [Internet]. 2025 Apr 28;40(3):1–14. Available from: https://link.springer.com/10.1007/s10896-023-00648-x

34. Perles F, San Martín J, Canto JM, Vallejo M. The Role of Gender in the Perception of Different Forms of Psychological Violence in Young Couples. J Fam Issues [Internet]. 2022 Apr 4;43(4):923–43. Available from: https://journals.sagepub.com/doi/10.1177/0192513X21996390

35. Cascardi M, Hassabelnaby R, Schorpp H, Smith Slep AM, Jouriles EN, O'Leary KD. The Relationship Behavior Survey: A Comprehensive Measure of Psychological Intimate Partner Violence for Adolescents. J Interpers Violence [Internet]. 2023 May 30;38(9–10):7012–36. Available from: https://journals.sagepub.com/doi/10.1177/08862605221140044

36. Mclennan L, Lyne M, Halfmann K. College Students' Perceptions and Willingness to Report Intimate Partner Violence. J Interpers Violence [Internet]. 2025 May 3;0(0). Available from: https://journals.sagepub.com/doi/10.1177/08862605251336336

37. García-Ruiz M, Ruiz-Fernández MD, Jiménez-Lasserrotte M del M, Fernández-Medina IM, Ventura-Miranda MI. Gender-Based Dating Violence and Social Media among Spanish Young People: A Qualitative Study. Behav Sci (Basel) [Internet]. 2024 Jul 7;14(7):575. Available from: https://www.mdpi.com/2076-328X/14/7/575

38. Kim S-H, Cho D. Psychometric properties of Leisure Satisfaction Scale (LSS)-short form: a Rasch rating model calibration approach. BMC Psychol [Internet]. 2022 Dec 15;10(1):151. Available from: https://bmcpsychology.biomedcentral.com/articles/10.1186/s40359-022-00861-1

39. Tomaszewska P, Schuster I. Prevalence of teen dating violence in Europe: A systematic review of studies since 2010. New Dir Child Adolesc Dev [Internet]. 2021 Jul;2021(178):11–37. Available from: https://onlinelibrary.wiley.com/doi/10.1002/cad.20437

40. Vives-Cases C, Pérez-Martínez V, Davó-Blanes Mc, SanSegundo MS, Gil-González D, Abiétar DG, et al. Dating Violence and Associated Factors Among Male and Female Adolescents in Spain [Internet]. 2021. Available from: https://www.researchsquare.com/article/rs-337188/v1

41. O'Neill B. Sample size determination with a pilot study. Chen Z, editor. PLoS One [Internet]. 2022 Feb 15;17(2):e0262804. Available from: https://dx.plos.org/10.1371/journal.pone.0262804

42. Sukarelawan MI, Ramadhan MF, Oktova R, Jumadi J, Puspitasari AD, Indratno TK, et al. Psychometric properties of Indonesian physics motivation questionnaire using Rasch model. Int J Eval Res Educ [Internet]. 2024 Dec 1;13(6):4279. Available from: https://ijere.iaescore.com/index.php/IJERE/article/view/29285

43. Panahi S, Bazrafshani A, Mirzaie A. Development and validation of a modified LibQUAL scale in health sciences libraries: application of Structural Equation Modeling. J Med Libr Assoc [Internet]. 2023 Oct 2;111(4):792–801. Available from: http://jmla.pitt.edu/ojs/jmla/article/view/1348

44. Vivian Wong Shao Yun, Norhidayah Md Ulang, Siti Hamidah Husain. Measuring the Internal Consistency and Reliability of the Hierarchy of Controls in Preventing Infectious Diseases on Construction Sites: The Kuder-Richardson (KR-20) and Cronbach's Alpha. J Adv Res Appl Sci Eng Technol [Internet]. 2023 Oct 14;33(1):392–405. Available from: https://semarakilmu.com.my/journals/index.php/applied_sciences_eng_tech/article/view/4297

45. Sukarelawan MI, Jumadi J, Kuswanto H, Thohir MA. The Indonesian Version of the Physics Metacognition Inventory: Confirmatory Factor Analysis and Rasch Model. Eur J Educ Res [Internet]. 2021 Oct 15;10(4):2133–44. Available from: https://www.eu-jer.com/the-indonesian-version-of-the-physics-metacognition-inventory-confirmatory-factor-analysis-and-rasch-model

46. Handayani T, Sukarelawan MI, Matore MEEM, Saifuddin MF. Adaptation and evaluation of psychometric properties of HELAM using the Rasch model in the Indonesian context. Int J Eval Res Educ [Internet]. 2023 Dec 1;12(4):2362. Available from: https://ijere.iaescore.com/index.php/IJERE/article/view/27703

47. Norhayati MN, Fatin Imtithal A, Nor Akma MJ. Psychometric properties of the Malay version of the Women's Views of Birth Labour Satisfaction Questionnaire using the Rasch measurement model: a cross sectional study. BMC Pregnancy Childbirth [Internet]. 2020 Dec 14;20(1):295. Available from: https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-020-02975-z

48. Pentapati KC, Chenna D, Kumar VS, Kumar N. Reliability generalization meta-analysis of Cronbach's alpha of the oral impacts on daily performance (OIDP) questionnaire. BMC Oral Health [Internet]. 2025 Feb 11;25(1):220. Available from: https://bmcoralhealth.biomedcentral.com/articles/10.1186/s12903-025-05496-3

49. Norhayati MN, Zanaridah MN, Che Yusof R. Validation of the knowledge on the Noor evidence-based medicine questionnaire for healthcare professionals: Rasch analysis. Electron J Gen Med [Internet]. 2023 Nov 1;20(6):em534. Available from: https://www.ejgm.co.uk/article/validation-of-the-knowledge-on-the-noor-evidence-based-medicine-questionnaire-for-healthcare-13535

50. Tennant A, Küçükdeveci AA. Application of the Rasch measurement model in rehabilitation research and practice: early developments, current practice, and future challenges. Front Rehabil Sci [Internet]. 2023 Jul 17;4:1208670. Available from: https://www.frontiersin.org/articles/10.3389/fresc.2023.1208670/full

51. Tutz G. Invariance of comparisons: Separation of item and person parameters beyond Rasch models. J Math Psychol [Internet]. 2024 Sep;122:102876. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0022249624000452

52. Brandt S, Moulton M, Duckor B. Advances in Rasch modeling: New applications and directions. Psychol Test Assess Model [Internet]. 2015;57(3):338–41. Available from: https://www.psychologie-aktuell.com/fileadmin/download/ptam/3-2015_20150925/03_Brandt.pdf

53. Liu F, Zhang Z, Lin B, Ping Z, Mei Y. Assessing the psychometric properties of the Chinese return-to-work self-efficacy questionnaire using Rasch model analysis. Health Qual Life Outcomes [Internet]. 2022 Dec 16;20(1):27. Available from: https://hqlo.biomedcentral.com/articles/10.1186/s12955-022-01929-7

54. Boone WJ, Staver JR. Point Measure Correlation. In: Advances in Rasch Analyses in the Human Sciences [Internet]. Cham: Springer International Publishing; 2020. p. 25–38. Available from: https://link.springer.com/10.1007/978-3-030-43420-5_3

55. Sumintono B, Widhiarso W. Aplikasi model rasch untuk penelitian ilmu-ilmu sosial. Cimahi: Trim Komunikata Publishing House; 2014.

56. Wang A, Duan Y, Saeidzadeh S, Norton PG, Estabrooks CA. Validation of the Maslach burnout inventory-

general survey 9-item short version (MBI-GS9) among care aides in Canadian nursing homes. BMC Health Serv Res [Internet]. 2025 Jan 16;25(1):89. Available from: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-025-12235-5

57. Brar P, Boat AA, Brady SS. But He Loves Me: Teens' Comments about Healthy and Unhealthy Romantic Relationships. J Adolesc Res [Internet]. 2023 Jul 25;38(4):632–65. Available from: https://journals.sagepub.com/doi/10.1177/07435584221079726

58. Delgado E, Serna C, Martínez I, Cruise E. Parental Attachment and Peer Relationships in Adolescence: A Systematic Review. Int J Environ Res Public Health [Internet]. 2022 Jan 18;19(3):1064. Available from: https://www.mdpi.com/1660-4601/19/3/1064

59. Jorgensen-Wells MA, James SL, Holmes EK. Attachment Development in Adolescent Romantic Relationships: A Conceptual Model. J Fam Theory Rev [Internet]. 2021 Mar 10;13(1):128–42. Available from: https://onlinelibrary.wiley.com/doi/10.1111/jftr.12409

60. Telaumbanua AB. Representasi Kekerasan Simbolik terhadap Perempuan dalam Film "Posesif" (2017) [Internet]. Universitas Multimedia Nusantara; 2023. Available from: https://kc.umn.ac.id/id/eprint/23932/

61. Kaplenko H, Loveland JE, Raghavan C. Relationships Between Shame, Restrictiveness, Authoritativeness, and Coercive Control in Men Mandated to a Domestic Violence Offenders Program. Violence Vict [Internet]. 2018 Apr 1;33(2):296–309. Available from: http://www.ingentaconnect.com/content/10.1891/0886-6708.VV-D-16-00123

62. Mustapha NM. Nature and prevalence of domestic violence against men in dala local government area of kano state, nigeria. J Fac Soc Sci [Internet]. 2017;12(1):10–20. Available from: http://universityjournals.org/journal/JSMS/article-full-text-pdf/CBAF8E742

63. Nazir T. Unraveling the Nexus: Emotional Abuse, Emotional Competence, Self-concept, and Academic Achievement Among Adolescents. J Fam Couns Educ [Internet]. 2024 Jul 25;9(1):45–60. Available from: http://dergipark.org.tr/en/doi/10.32568/jfce.1393509

64. Smith S. Barriers to and Facilitators of Self-Disclosure by Male Victims of Child Sexual Abuse a Rapid Review [Internet]. 2024. p. 1–35. Available from: https://www.ssrn.com/abstract=4841957

65. Felmlee D, Sweet E, Sinclair HC. Gender Rules: Same- and Cross-Gender Friendships Norms. Sex Roles [Internet]. 2012 Apr 12;66(7–8):518–29. Available from: http://link.springer.com/10.1007/s11199-011-0109-z

66. Rutledge J, Abrams J. Gender role socialization and adolescent health. In: Encyclopedia of Child and Adolescent Health [Internet]. Elsevier; 2023. p. 647–59. Available from: https://linkinghub.elsevier.com/retrieve/pii/B9780128188729000893