

Featured Research

# Validation of the Student Early Detection of Pornography (EDP) Scale Instrument Using Jamovi

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#### **Abstract:**

Technological advances make it easier for teenagers to access potentially damaging content, such as pornography, which has a negative impact on their mental and social health. For this reason, media or tools for early detection of pornographic behavior among teenagers are very important, especially for guidance and counseling teachers in providing appropriate services for students. This study aims to test the validity of the e-booklet-based Early Detection of Pornography (EDP) instrument. The research method used was quantitative with Confirmatory Factor Analysis (CFA) carried out on 97 grade 9 students of SMP Negeri 1 Wagir, through quota sampling. The validity of the instrument was assessed by experts, and construct validity was tested through CFA using Jamovi software. The results show adequate fit index values (CFI=0.902, RMSEA=0.0896), with high reliability (Cronbach's a=0.855). This instrument has consistent good results and is able to detect early pornographic behavior among teenagers. With high validity and reliability results, it is hoped that this e-booklet-based EDP instrument will be useful for guidance and counseling teachers for early detection of pornographic behavior among teenagers

**Keywords:** Early Detection of Pornography, Validation, Jamovi

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## **INTRODUCTION**

The phenomenon of pornography exposure among students has become a serious issue, drawing the attention of various stakeholders, including educators (Lewoleba & Fahrozi, 2020). A recent report from the Indonesian Child Protection Commission (KPAI) in 2023 revealed that over 25% of children aged 10–15 years have been exposed to pornographic materials, with significant consumption occurring through digital platforms such as social media and online games. Moreover, the ease of access to digital devices has exacerbated this exposure in both urban and rural areas (Ministry of Women's Empowerment and Child Protection, 2023). In some cases, early exposure to pornographic content in Indonesia has been reported to start as early as nine years of age (Mattiro et al., 2022).

Pornography exposure significantly harms students' psychosocial development. From an educational perspective, such exposure also has serious implications for academic performance (Beyens et al., 2014). Students who frequently access pornographic content tend to exhibit decreased concentration, reduced motivation to learn, and may even experience anxiety or depression due to internal conflicts arising from this behavior. In the long term, habitual access to pornography can develop into a behavioral addiction known as Pornography Addiction Disorder (PAD), a condition increasingly recognized as a clinical disorder that disrupts students' personal and social life balance (Chu et al., 2023).

Early detection of behaviors or tendencies among students related to pornography exposure is crucial to preventing broader negative impacts on their psychosocial development (Mubarak Ali et al., 2024). Exposure to pornography during adolescence can hinder emotional development, shape perceptions and expectations of interpersonal relationships, and increase the risk of engaging in risky sexual behaviors (Astuti, 2013; Ballester-Arnal et al., 2023). Early detection allows teachers and counselors to recognize initial signs of tendencies or interests toward pornographic content, enabling timely interventions before such behavioral patterns become entrenche (Rosa, 2023). These interventions not only aim to reduce access or addiction but also to build students' understanding of its negative impacts and strengthen positive values such as self-control, self-awareness, and the ability to filter information in a healthy and growth-oriented manner.

Although numerous studies highlight the risks of pornography exposure, there is a lack of validated instruments tailored specifically to the context of adolescents in Indonesia. Most existing tools focus solely on addiction or sexual behavior without comprehensively addressing early exposure detection, making them less applicable for counselors and educators. Furthermore, instruments that are specific to Indonesia's sociocultural context are still very limited, reducing their effectiveness in addressing local challenges. Early detection, guidance programs, and counseling can be directed toward providing sustained support and sexual health education. This includes efforts to enhance digital literacy, equip students with skills to navigate the internet wisely, and develop strategies for managing curiosity without resorting to harmful content.

To address this need, the *Early Detection of Pornography (EDP)* instrument was developed to help educators and counselors identify tendencies or behaviors indicative of early exposure to pornography (Bernstein et al., 2023; Vandenbosch & Peter, 2016). The EDP instrument is designed not only as a tool for measuring exposure but also to explore psychological and behavioral factors that may predict such tendencies. In an increasingly connected digital environment, this scale aims to serve as a practical, evidence-based early screening tool, enabling schools to implement appropriate interventions before more severe consequences emerge (Borgogna et al., 2024; Wright et al., 2021).

Validation of psychological research instruments, including the EDP scale, is essential to ensure the instrument accurately and consistently measures what it is intended to measure (García-Vargas et al., 2022). Validation ensures that the EDP scale possesses construct validity, demonstrating the extent to which it accurately measures the concept of tendencies toward pornography exposure (Härtel et al., 2023; Kohut et al., 2020). Without adequate validity, measurement results may become meaningless or even misleading,



failing to truly reflect the behaviors or tendencies the instrument aims to identify. Validating an instrument is a crucial step to ensure measurement accuracy and consistency, particularly for scales like the EDP (Sullivan, 2011).

The selection of appropriate software is also critical in this process. Jamovi was chosen for data analysis due to several advantages related to instrument validation. As open-source software, Jamovi offers high accessibility for researchers and institutions with limited budgets, allowing for use without licensing fees (Ashour, 2024; Şahin & Aybek, 2020). This facilitates researchers in focusing on analysis without the financial constraints often associated with commercial statistical software (Niu et al., 2021; Şahin & Aybek, 2020). Jamovi provides essential statistical features for the validation process, such as reliability analysis (Cronbach's alpha coefficient) to measure the internal consistency of the EDP scale items, as well as exploratory and confirmatory factor analysis to validate the construct structure of the instrument. These features are critical for ensuring that the EDP scale accurately measures students' tendencies toward pornography exposure. Additionally, Jamovi offers user-friendly data visualizations, assisting researchers in intuitively examining data distributions and relationships between variables (Watson, 2017).

With a spreadsheet-like interface and intuitive navigation, Jamovi allows researchers to input data and perform analyses directly without requiring advanced programming knowledge. This ease of use is particularly beneficial for novice researchers or users without a strong statistical background. Thus, Jamovi is an efficient and effective choice for instrument validation, helping researchers ensure that measurement results are reliable for developing evidence-based and impactful interventions

The expected outcome of this research is a valid and reliable Early Detection of Pornography (EDP) scale that accurately identifies students' tendencies toward pornography exposure. Practically, this scale will serve as a valuable tool for educators and counselors in early risk detection and designing appropriate interventions, assisting students in developing self-control and healthy digital literacy. Theoretically, this scale contributes to the literature on early detection instruments in the context of digital behavior and adolescent mental health, paving the way for further research into the psychological and social factors influencing exposure to risky content during school-age years.

## **METHOD**

The research employs a quantitative approach with an instrument validation method. The validation process includes Confirmatory Factor Analysis (CFA) sing Jamovi software to ensure that the hypothesized factor structure aligns with the collected data (Azwar, 2018; Saptono, 2017). The study involves ninth-grade students from SMP Negeri 1 Wagir. Ninth-grade students are typically in a critical transitional phase from late childhood to early adolescence. During this stage, they begin to exhibit significant changes in emotional, social, and cognitive development. This period is often marked by identity exploration, heightened curiosity, and vulnerability to external influences, including exposure to digital media and pornography (Suryana et al., 2022). Therefore, ninth grade was chosen because this age group is considered the most relevant for exploring the impact of pornography exposure and related behaviors. he research population consists of all ninth-grade students, with a sample drawn using quota sampling. The total sample size is 97

students, selected to achieve a specific number from the population without special selection criteria, deemed representative for the research needs.

The research instrument is the Early Detection of Pornography (EDP) scale, comprising 36 items. Each item uses a 4-point Likert scale, where respondents indicate their level of agreement fr(Azwar, 2018)om "strongly disagree" to "strongly agree (Azwar, 2018)." This instrument is designed to measure various dimensions of early detection behaviors related to pornography exposure. The instrument validation process includes several stages. Content validity was assessed by three guidance and counseling experts who evaluated item adequacy and relevance to the measurement goals. Construct validity was then tested using CFA to verify whether the instrument items align with the expected factor structure. Criterion validity was also measured by examining correlations between the EDP results and other relevant scales. Reliability testing involved calculating Cronbach's Alpha to assess internal consistency, with an expected value above 0.70, indicating good reliability (Mujlli et al., 2023). The data obtained from the instrument were analyzed in Jamovi using Exploratory Factor Analysis (EFA) followed by CFA. EFA was conducted initially to explore the emergent factor structure, while CFA was used to confirm the identified structure. Advanced reliability testing was conducted to strengthen validity and ensure the overall internal consistency of the instrument.

### RESULTS AND DISCUSSION

#### **RESULTS**

Here are the results of the analysis and statistical description:

**Tabel 1. CFA Result** 

Factor	Indicator	Estimate	SE	Z	p	Stand. Estimate
Aktivitas	2	0.317	0.0600	5.28	<.001	0.549
	5	0.320	0.0574	5.58	<.001	0.587
	6	0.477	0.0728	6.55	<.001	0.631
Refleksi	10	0.594	0.0688	8.63	<.001	0.771
	13	0.412	0.0550	7.49	<.001	0.699
	14	0.447	0.0580	7.71	<.001	0.711
	17	0.566	0.0914	6.19	<.001	0.601
	18	0.706	0.0705	10.02	<.001	0.853
Kesenangan	21	0.301	0.0534	5.63	<.001	0.564
	22	0.426	0.0599	7.12	<.001	0.678
	25	0.242	0.0460	5.26	<.001	0.527
	26	0.621	0.0685	9.07	<.001	0.801
Kegairahan	34	0.575	0.0627	9.17	<.001	0.800
	33	0.593	0.0603	9.83	<.001	0.840
	30	0.457	0.0748	6.11	<.001	0.592
	29	0.450	0.0519	8.67	<.001	0.770

Based on the CFA results, the data shows various indicators with standardized estimate values ranging from 0.527 to 0.853. Factors such as Activity, Reflection, Enjoyment, and Enthusiasm have strong standardized values, indicating adequate strength in the relationship between the indicators and the factors being measured. A CFI (Comparative Fit Index) value of 0.902 indicates that the model is quite good, as values above 0.90 are

considered acceptable. The TLI (Tucker-Lewis Index) is slightly lower at 0.880, suggesting an almost adequate fit, though there is still room for improvement. The RMSEA (Root Mean Square Error of Approximation) value of 0.0896 indicates that the model has a moderate fit.

The construct validity of the EDP instrument also needs to be assessed through the CFA results. Construct validity is measured by examining whether each item has a significant correlation with the intended construct. Based on the available results, high correlations were found between factors, such as between Activity and Reflection (0.935) and between Enjoyment and Enthusiasm (0.946). These high correlations indicate a strong interrelation between these factors, but they also suggest that these factors may need to be re-evaluated to ensure that each factor is truly distinct (non-overlapping) from the others.

Tabel 2. Model Fit Using Chi Square

Test for Exact Fit			
$\chi^2$		df	p
	174	98	<.001

The model fit test using the chi-square ( $\chi 2 \cdot \text{chi}^2 \chi 2$ ) test produced a  $\chi 2 \cdot \text{chi}^2 \chi 2$  value of 174 with 98 degrees of freedom (df) and a p-value < .001. This result indicates that the model does not meet the criteria for exact fit, as there is a significant difference between the observed covariance matrix and the one estimated by the model. However, the  $\chi 2 \cdot \text{chi}^2 \chi 2$  test is highly sensitive to sample size, so a significant p-value (< .001) does not necessarily mean that the model is invalid, particularly when the instrument is used with a large population. In the context of early detection instruments for pornography exposure, these results highlight the need to assess model fit using additional indices, such as CFI, TLI, RMSEA, or SRMR, to ensure the model adequately represents the data.

An instrument designed to detect pornography exposure requires good model fit to ensure that its indicators, such as behavioral habits, media exposure, or emotional changes, can be measured accurately. If the model has poor fit, detection results may be biased or invalid, hindering the instrument's ability to identify exposure early. By ensuring the model achieves adequate fit through additional fit indices, the instrument can function effectively, supporting interventions or follow-up actions necessary to address individuals exposed to pornography.

**Tabel 3. Fit Measures** 

Fit Measures							
		_	RMSEA 90% CI				
CFI	TLI	RMSEA	Lower	Upper			
0.902	0.880	0.0896	0.0674	0.111			



The model fit assessment shows that the CFI (Comparative Fit Index) value of 0.902 indicates the model has a reasonably good fit. Generally, a CFI value above 0.90 is considered acceptable (*acceptable fit*), although it has not reached the category of excellent fit. Meanwhile, the TLI (Tucker-Lewis Index) value of 0.880 is slightly below the expected threshold (0.90), suggesting that the model approaches an acceptable fit but requires some refinement.

On the other hand, the RMSEA (Root Mean Square Error of Approximation) value of 0.0896 indicates that the model's fit is less than adequate, as it exceeds the threshold of 0.08. However, the lower bound of the 90% confidence interval (0.0674) suggests the possibility of a reasonable fit, while the upper bound (0.111) reflects the risk of poor fit. Overall, this model is acceptable for certain purposes but requires further improvements, such as revising indicators or the model structure, to achieve optimal fit and ensure it represents the data more effectively.

### Discussion

Pornography is a serious issue that requires special attention, particularly among adolescents in school settings. Pornographic content can negatively impact brain development, cognition, mental and social health, and increase the risk of unsafe sexual behaviors. This aligns with the research by Hariyani et al., (2012), which found that the intensity of watching pornography correlates with decreased study concentration and increased deviant sexual behaviors. A study by the puslitjakdikbud team also revealed that nearly all students (91.6%) had been exposed to pornographic content. The media used by students to access pornography include internet sites (39.2%), social media (17.6%), and online games (16.1%). The ease of internet access and digital technology has further facilitated adolescent access to pornographic content, highlighting the urgent need for early detection. This finding aligns with Santrock (2017) study, which emphasized that adolescence is a period of identity exploration where individuals are vulnerable to negative environmental influences, including media exposure. Therefore, a digital, concise, and user-friendly detection tool is essential to assist school counselors in proactively identifying pornography-related behaviors. Early detection modules based on e-booklets for addictive behaviors in adolescents have proven highly effective in enhancing students' and teachers' understanding of the signs of addictive behaviors. This finding is consistent with (Herlina, 2020) research, which showed that interactive technology-based media can improve educational effectiveness in schools.

The e-booklet-based Early Detection of Pornography (EDP) instrument was developed to meet this need, providing a consistent and accurate tool for counselors to assess pornography-related behaviors among students. Based on descriptive statistical analysis in Confirmatory Factor Analysis (CFA), the standardized estimate values for each instrument indicator range from 0.527 to 0.853, with factors such as Activity, Reflection, Enjoyment, and Enthusiasm showing strong standardized estimates. These findings support previous research by Chen et al. (2016), which demonstrated that factors such as emotional engagement (enjoyment) and deep reflection significantly correlate with media-based behaviors. This indicates that the tested indicators are strongly related to the factors

they are intended to measure, making the instrument reliable for early detection. The CFA results also show that the model fits the data reasonably well. A Chi-square value of 174 with 98 degrees of freedom (df) and a p-value < .001 indicates a significant difference between the model and the actual data. However, this result is acceptable given the relatively large sample size. A CFI value of 0.902, TLI of 0.880, and RMSEA of 0.0896 (90% CI: 0.0674 - 0.111) suggest a moderate fit with the data. These findings align with Hu and Bentler's (1999) study, which stated that a CFI value above 0.90 and RMSEA below 0.10 indicate a reasonably adequate model fit. These fit indices demonstrate that the e-booklet-based EDP model is adequate for use in school counseling contexts.

These high correlations suggest a strong relationship among factors, although they also indicate that some factors may require further evaluation to ensure distinctiveness (non-overlapping) among factors. These findings support Samsinar & Maisaroh (2022) research, which stated that relationships between factors such as reflection and enthusiasm could serve as critical indicators in identifying at-risk behaviors. Based on reliability analysis, the EDP instrument shows a Cronbach's  $\alpha$  of 0.855 and McDonald's  $\omega$  of 0.889, indicating a high level of reliability. In psychometric contexts, high reliability ensures that the instrument generates consistent and trustworthy data, particularly for detecting sensitive behaviors such as pornography exposure. This study also aligns with Hidayat et al., (2022) findings, which emphasized that technology-based instruments with high reliability can be effectively utilized in decision-making for school counseling.

This study has several limitations. First, the sample is limited to a single middle school (SMP Negeri 1 Wagir), which may restrict the generalizability of the findings to a broader population. Additionally, the short data collection period may affect the accuracy of students' responses, which could vary depending on their psychological and social conditions. This finding is consistent with Nugroho (2019) research, which found that social and cultural contexts significantly influence students' responses to technology-based instruments. To enhance the quality and generalizability of the EDP instrument, future studies should include larger and more diverse samples to test the reliability and validity of the instrument in various contexts. Furthermore, priority should be given to improving items with negative correlations. By analyzing and revising items with low or negative correlations, the consistency of the results will be further strengthened. Future studies could also conduct convergent validity testing with other relevant instruments to improve the accuracy and precision of the EDP as an early detection tool among adolescent

### **CONCLUSIONS**

The e-booklet-based Early Detection of Pornography (EDP) instrument was developed to assist school counselors in the early detection of pornography-related behaviors among adolescents. With measurable indicators such as Activity, Reflection, Enjoyment, and Enthusiasm, this instrument leverages digital technology to facilitate practical use in a school context. Statistical analysis through Confirmatory Factor Analysis (CFA) indicates that the instrument has good validity. This suggests that these indicators are strongly associated with the factors being measured, making this instrument potentially

beneficial for early detection of pornography-related behaviors and helping counselors to take appropriate preventive measures against risky behaviors among students.

Reliability analysis results show that the EDP instrument has a very high level of consistency, with a Cronbach's  $\alpha$  of 0.855 and a McDonald's  $\omega$  of 0.889. Based on these validity and reliability findings, the instrument has proven to be accurate and consistent in the early detection of pornography-related behaviors among adolescents. With high validity and reliability, this instrument provides a strong foundation for school counselors to rely on when developing preventive assessments. However, it is recommended that future researchers conduct further studies to expand the application and enhance the accuracy of the instrument across a broader population

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