

The Moderating Role of Self-Regulation in the Relationship Between Sexual Health Literacy and Risky Sexual Behavior Among Online Dating App Users

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Abstract. This study examines how Self-Regulation (SR) moderates the relationship between Sexual Health Literacy (SHL) and Risky Sexual Behavior (RSB) among online dating users in Indonesia. Using a quantitative approach with 166 participants aged 17–35 years, data were analyzed through Moderated Regression Analysis (MRA). Results showed that SHL negatively predicts RSB, indicating that individuals with higher sexual health literacy are less likely to engage in risky sexual behaviors. Moreover, SR significantly strengthened this relationship, confirming its moderating role. Users with high SR effectively translate sexual knowledge into safer digital behaviors, while low SR users remain vulnerable despite adequate SHL. Within Bandura's Social Cognitive Theory framework, these findings highlight the reciprocal interaction between personal, behavioral control, and digital environment. Enhancing both SHL and SR is crucial for fostering ethical and safe sexual conduct in digital contexts.

Keywords: Sexual Health Literacy, Self-Regulation, Risky Sexual Behavior, Social Cognitive Theory, Online Dating.

1 Introduction

The evolution of digital technology has fundamentally transformed human interactions, including intimate and romantic relationships. In Indonesia, the widespread accessibility of the internet with penetration reaching 79.50% of the total population [1] has accelerated the rise of online dating platforms. The number of users increased from 3.5 million in 2019 to 4.6 million in 2024 [2], primarily among individuals aged 17–35 years, a developmental period marked by identity exploration and emotional experimentation [3]. While these platforms facilitate social connection and provide opportunities for self-expression [4], they simultaneously expose users to elevated sexual risks, such as unprotected sex, casual encounters, and multiple partners [5].

Risky sexual behavior refers to sexual activities that increase the likelihood of contracting sexually transmitted infections (STIs) or experiencing unintended pregnancies [6]. National data Riskesdas [7] show that youth aged 15–24 years have the highest prevalence of syphilis (1.2%)

and limited understanding of HIV/AIDS prevention. These findings underscore the need to examine psychosocial factors that govern sexual decision-making among young adults who are active in digital spaces.

Sexual Health Literacy (SHL) plays a crucial role in enabling individuals to access, understand, and apply information related to sexual well-being [8]. In theory, individuals with higher SHL should exhibit more preventive sexual behaviors due to their heightened awareness of risks and consequences [9]. However, research has shown that knowledge alone does not necessarily prevent risk-taking, as impulsive tendencies and emotional factors may override rational decision-making (Graf & Patrick, 2015; Needham et al., 2010) [10], [11]. Thus, understanding the mechanisms that strengthen the translation of sexual knowledge into safe behavior is vital.

Bandura's Social Cognitive Theory [12] provides a robust framework to explain how personal, behavioral, and environmental determinants interact reciprocally to shape human action. The personal component encompasses both cognitive functions (e.g., knowledge, beliefs, values) and self-regulatory capacities that govern behavioral control. In the context of online dating, the digital environment functions as an environmental determinant that provides stimuli, feedback, and reinforcement influencing users' sexual behavior. Here, Self-Regulation (SR) serves as a moderating process that strengthens the interaction between personal factors and behavioral expressions, enabling individuals to maintain behavioral consistency even under environmental temptations.

Self-regulation operates through three interconnected mechanisms: self-monitoring (observing one's actions and contextual cues), judgmental process (evaluating behavior against internal standards and social norms), and self-reactive influence (applying rewards or corrective actions) [12]. These processes empower individuals to manage impulses and align their behaviors with long-term goals, even within the instant gratification environment of dating applications. When encountering suggestive messages or opportunities for immediate sexual engagement, individuals with strong SR can regulate emotional arousal, reflect on potential outcomes, and make decisions consistent with moral and health standards. Thus, SR strengthens the reciprocal linkage between personal regulation, behavioral execution, and environmental context.

Empirical evidence supports this moderating function of SR. Fernández-Theoduloz et al. [13] found that individuals with higher SR exhibited lower levels of cybersexual risk-taking, while Malyhin [14] emphasized SR's buffering role in the link between sexual cognition and impulsive behavior. These findings highlight SR's importance as a strengthening moderator that ensures the cognitive potential of SHL translates into responsible sexual conduct within digital spaces.

Despite the growing literature on SHL and SR, few studies have examined how SR moderates the SHL-RSB relationship within the digital domain. This research gap is particularly relevant in Indonesia, where cultural values, religiosity, and technological exposure intersect uniquely in shaping sexual norms [15]. Understanding SR as a moderator can reveal how personal control mechanisms interact with knowledge and environment to mitigate sexual risk behaviors.

Therefore, this study aims to investigate the moderating role of Self-Regulation in the relationship between Sexual Health Literacy and Risky Sexual Behavior among online dating app users in Indonesia. Specifically, the study examines (1) the direct effect of SHL on RSB, (2) the moderating influence of SR on the SHL-RSB relationship, and (3) the theoretical contribution of SR as a strengthening psychological mechanism that integrates personal, behavioral, and environmental factors within the SCT framework.

This investigation extends behavioral theory to digital sexuality by demonstrating how Self-Regulation fortifies the link between sexual knowledge and behavior. The study's implications emphasize the development of interventions that not only enhance sexual health literacy but also cultivate self-regulatory competencies essential for promoting ethical, safe, and adaptive sexual behavior in the digital age.

2 Method

2.1 Research Design, Participants, and Procedure

This study employed a quantitative approach with a causal-associative design [16] aimed at examining cause and effect relationships among variables, where changes in the independent variable were expected to influence the dependent variable. The independent variable was Sexual Health Literacy (SHL), the moderating variable was Self-Regulation (SR), and the dependent variable was Risky Sexual Behavior (RSB).

Participants were Indonesian online dating app users aged 17–35 years, a group identified as digitally active and vulnerable to risky sexual behavior due to exploratory identity and relational motives [17], [18]. Purposive sampling was employed to ensure participants met inclusion criteria: (1) aged 17–35 years, (2) current or past users of dating applications, (3) provided informed consent, and (4) had prior sexual experience [19]. The minimum sample size was calculated using G*Power (effect size = 0.15, α = 0.05, power = 0.80, predictors = 3), requiring at least 77 participants. The final dataset included 166 valid responses, exceeding this threshold.

Data were collected via Google Forms, and the survey link was disseminated through dating platforms, social media, and online communities related to digital relationships. Participants received detailed study information and provided online informed consent ensuring anonymity, confidentiality, and voluntary participation.

2.2 Measures

Three validated instruments were utilized. The Sexual Risk Survey (SRS) [6] measured five dimensions of RSB: sexual risk-taking with uncommitted partners, risky sex acts, impulsive sexual behavior, intent to engage in risky sex, and risky anal sex acts. The adapted version underwent translation and expert review for cultural relevance, retaining 16 valid items after confirmatory factor analysis (CFA) with high reliability (α and Ω = 0.870–0.962).

The Sexual Health Literacy Scale (HLS-EU-SQ10-IDN), derived from the European Health Literacy Survey and validated in Indonesia, assessed SHL through 10 items across four domains: accessing, understanding, evaluating, and applying information. CFA results indicated an excellent model fit (CFI = 0.981, RMSEA = 0.051) and strong reliability (α = 0.909).

The Short Self-Regulation Questionnaire (SSRQ) [20] evaluated SR as a unidimensional construct reflecting behavioral, emotional, and cognitive control. After cultural adaptation and validation, 13 items were retained with excellent reliability (α = 0.881–0.924) and good model fit indices (CFI = 0.992, RMSEA = 0.031).

2.3 Data Analysis

Data analysis was conducted using JASP version 0.95.1.0. Descriptive statistics summarized participant demographics and variable characteristics. Prior to hypothesis testing, assumptions of normality, linearity, heteroscedasticity, and multicollinearity were examined. The main

analysis employed Moderated Regression Analysis (MRA) as proposed by Hayes [21], testing the interaction term (SHL \times SR) to determine the moderating effect. A significant interaction coefficient ($p < 0.05$) confirmed that SR moderated the relationship between SHL and RSB, indicating that higher SR strengthened the influence of SHL in reducing RSB.

2.4 Ethical Considerations

This study adhered to the ethical principles of beneficence, respect for persons, and justice. All participants were informed of their rights, and data were collected and analyzed confidentially. Ethical approval was granted by Universitas Negeri Padang's Health Research Ethics Committee (No.009/KEPK-UNP/6/2025).

3 Results

3.1 Overview

This section presents the research findings, including descriptive data of respondents, variable statistics, classical assumption tests, and hypothesis testing through regression and moderation analyses. Results are structured systematically and interpreted in the context of Sexual Health Literacy (SHL), Self-Regulation (SR), and Risky Sexual Behavior (RSB) among online dating application users.

3.2 Respondent Demographics

A total of 166 respondents participated in this study, completing all survey components. The majority were male (70.5%), aged 22–35 years (74.7%), held a bachelor's degree (46.4%), and identified as heterosexual (68.1%). This demographic profile reflects a digitally active population typical of dating app users in Indonesia.

3.3 Descriptive Statistics and Variable Categorization

The descriptive results show that the mean score of Sexual Health Literacy (SHL) was 31.36 (SD = 4.623), indicating a moderate level of sexual health knowledge among respondents. Self-Regulation (SR) had a mean of 39.13 (SD = 8.171), also within the moderate range, reflecting participants' balanced ability to control impulses and behavior in digital contexts. Meanwhile, Risky Sexual Behavior (RSB) averaged 30.87 (SD = 14.94), suggesting that respondents generally engaged in moderate levels of sexual risk-taking.

Further categorization analysis reinforces these findings. For RSB, 60.8% of respondents fell into the moderate category, while 18.7% were in the low category and 20.5% in the high category. This distribution illustrates that most online dating app users are not at extreme risk but remain vulnerable due to contextual factors such as anonymity and social norms of digital dating. Similarly, SHL was found to be moderate for 61.4% of respondents, high for 22.3%, and low for 16.3%, demonstrating that most participants possess adequate yet not optimal sexual health knowledge. Self-Regulation was also predominantly moderate (66.3%), followed by low (17.5%) and high (16.2%) levels, indicating that most individuals have a fair capacity for behavioral control but still require development in maintaining consistent regulation across online interactions.

3.4 Assumption Tests

Classical assumption tests confirmed that data met linear regression requirements. Q-Q plots and residual histograms indicated normality and linearity, scatterplots showed no

heteroscedasticity, and multicollinearity was absent (Tolerance = 0.993, VIF = 1.007). These results validated the use of moderated regression analysis (MRA).

3.5 Regression Analysis: SHL → RSB

Table 1 presents the simple linear regression results examining the effect of Sexual Health Literacy on Risky Sexual Behavior.

Table 1. Simple Regression Analysis

Model	R ²	B	p-value
SHL → RSB	0.352	-1.916	< .001

The analysis showed that SHL significantly and negatively predicted RSB (B = -1.916, p < .001; R² = 0.352). This finding indicates that higher levels of sexual health literacy are associated with lower engagement in risky sexual behaviors, explaining 35.2% of the variance in RSB.

3.6 Moderation Analysis

Table 2 displays the results of the Moderated Regression Analysis (MRA) assessing the moderating role of Self-Regulation in the relationship between SHL and RSB.

Table 2. Moderated Regression Analysis

Variable	B	t-value	R	R ²	p-value
Constant	73.375	3.076			.002
SHL (X)	-0.128	-0.170			.865
Self-Regulation (M)	0.620	1.007			.315
SHL × SR	-0.051	-2.636	0.81	0.656	.009
Constant	73.375	3.076			.002

The moderation analysis revealed that the interaction between SHL and SR was significant (B = -0.051, p = .009), confirming that SR strengthens the relationship between SHL and RSB. Individuals with higher self-regulation were more capable of applying their sexual health knowledge to reduce risk behaviors. Including SR increased the model's explanatory power to 65.6%, underscoring the importance of self-regulatory mechanisms in sexual decision-making.

3.7 Additional Analysis: Sexual Orientation and RSB

Table 3 summarizes the results of a one-way ANOVA test examining differences in RSB across sexual orientations.

Table 3. ANOVA of RSB by Sexual Orientation

Source	Sum of Squares	df	Mean Square	F	p-value
Constant	73.375	3.076			.002
SHL (X)	-0.128	-0.170			.865
Self-Regulation (M)	0.620	1.007			.315
SHL × SR	-0.051	-2.636	0.81	0.656	.009
Constant	73.375	3.076			.002

The analysis indicated significant differences in RSB based on sexual orientation ($F(3,162) = 10.47, p < .001$). Heterosexual respondents reported significantly lower RSB compared to homosexual ($p < .001$), bisexual ($p = .031$), and other orientations ($p = .034$). This suggests that non-heterosexual groups may face higher contextual or psychosocial vulnerabilities within digital dating environments.

Overall, the findings affirm that while SHL alone contributes to safer sexual behavior, its effect is significantly enhanced when individuals possess strong self-regulation. This emphasizes Bandura's Social Cognitive Theory framework, where personal factors (self-regulation and literacy), behavior (sexual decision-making), and environment (digital dating context) reciprocally influence each other.

4 Discussion

4.1 Demographic and Variable Overview

This study involved 166 online dating application users, most of whom were male young adults aged 22–35 years. Psychologically, this phase is marked by identity exploration and the pursuit of intimate relationships, where romantic and sexual experiences play an integral role in self-discovery [3]. Within Bandura's Social Cognitive Theory [22], this stage represents a dynamic interaction between personal factors (biological drives, self-regulation, and individual values), behavior (sexual decision-making and relational experience), and environment (social and digital contexts).

In the context of online dating, the digital environment functions as an external factor influencing social and sexual behaviors. These platforms serve as spaces for observational learning and social reinforcement, shaping users' attitudes toward sexual relationships [23]. Meanwhile, Mardianto et al. [24], [25], [26] emphasizes the importance of using such digital platforms responsibly, highlighting that conscious and ethical engagement can reduce the likelihood of maladaptive online behaviors. The predominance of male users suggests that men are more likely to engage in dating apps for sexual exploration [27]. Furthermore, the fact that most respondents were university graduates indicates access to information and technology that facilitates sexual health awareness. However, the same technological exposure may also elevate the risk of engaging in risky sexual behaviors due to online sexual content and pornography [28], [29].

Interestingly, despite the association between dating app use and high-risk sexual behavior, results revealed that participants exhibited moderate levels of risky sexual behavior (RSB), sexual health literacy (SHL), and self-regulation. This balance can be attributed to a combination of SHL, religiosity, and self-regulatory capacity. Such findings reflect Bandura's principle of reciprocal determinism [12], where personal (SHL, self-regulation), behavioral (sexual decision-making), and environmental (digital exposure) factors interact continuously.

4.2 The Effect of Sexual Health Literacy on Risky Sexual Behavior

Regression analysis demonstrated that SHL had a significant negative relationship with RSB. Individuals with higher sexual health literacy were less likely to engage in risky behaviors. This supports findings by Small et al. [30] and Sutherland et al. [31], which identify SHL as a determinant of safe sexual decision-making. SHL equips individuals with the cognitive and evaluative skills to access, understand, appraise, and apply information relevant to sexual health

[8]. However, the moderate strength of this relationship suggests that knowledge alone is insufficient to drive consistent behavioral change, especially in emotionally charged or impulsive contexts. This aligns with critiques of the Health Belief Model (HBM), which overemphasizes rational cognition while underestimating affective and situational influences [32], [33]. Thus, an individual may understand sexual risks yet fail to act accordingly without adequate self-regulation.

4.3 The Moderating Role of Self-Regulation

Moderated Regression Analysis (MRA) confirmed that self-regulation significantly strengthens the inverse relationship between SHL and RSB. This means that individuals with strong self-regulation are more capable of translating knowledge into safe sexual practices, even when faced with social or digital temptations. Within the SCT framework, self-regulation mediates the reciprocal interaction among cognition, behavior, and environment by integrating three mechanisms: self-monitoring (awareness of one's behavior), judgmental processes (evaluating actions against internal and social standards), and self-reactive influence (rewarding or correcting behavior) [12].

Self-regulation bridges the gap between cognitive understanding and behavioral execution. It enables individuals to delay gratification, evaluate risks, and act consistently with health-oriented goals. Those with high SHL but low self-regulation may still engage in impulsive sexual acts, illustrating the knowledge-behavior gap [10]. Empirical studies [13], [34] reinforce this notion, showing that self-regulation not only correlates with safer behaviors but also moderates the influence of cognitive variables on risk outcomes.

4.4 Psychosocial Vulnerabilities and Sexual Orientation in Digital Contexts

Although an additional ANOVA analysis indicated significant differences in RSB across sexual orientations, this finding is best understood as exploratory. The higher RSB scores among non-heterosexual respondents may reflect psychosocial vulnerabilities unique to minority groups, including stigma, reduced access to health information, and heightened reliance on digital spaces for social connection. Within the framework of SCT, these contextual pressures can amplify environmental stimuli that challenge self-regulation. Thus, while this result is noteworthy, it should not overshadow the central moderating effect of self-regulation on the SHL-RSB relationship. Future studies are encouraged to investigate these dynamics more deeply through targeted sampling and qualitative inquiry.

4.5 Implications for Digital Dating Behavior

The findings emphasize that dating applications operate as socio-technological ecosystems where cognitive awareness and behavioral control are continuously tested. High self-regulation enables users to filter digital stimuli, resist impulsive decisions, and apply SHL effectively within online interactions. This highlights the importance of promoting digital self-regulation as a preventive strategy. Interventions should integrate sexual health education with behavioral skills training, fostering adaptive self-regulation in digital environments [23]. Furthermore, app developers could incorporate psychological design elements such as reflective prompts or health reminders to encourage responsible use without infringing user autonomy.

4.6 Limitations and Future Directions

This study is not without limitations. First, data were obtained via self-reported online surveys, which may introduce social desirability bias. Second, the sample size (N = 166) and age range

(17–35 years) limit generalizability across broader populations. Third, only three variables (SHL, self-regulation, RSB) were analyzed, omitting potential influences such as cultural norms, mental health, or economic factors. Lastly, differences among dating apps were not examined, despite potential behavioral distinctions across platforms.

Future research should employ mixed-method designs with larger and more diverse samples, integrating qualitative insights to capture the nuanced psychosocial dynamics of online sexual risk-taking. Investigating additional moderators such as digital literacy, emotional regulation, and social support would further clarify the mechanisms linking SHL and RSB.

5 Conclusion

In summary, this study affirms that while Sexual Health Literacy contributes to reducing risky sexual behaviors, its impact is significantly amplified by strong self-regulatory capacity. Within the Social Cognitive Theory framework, the interplay between personal, behavioral control, and environmental influence forms a reciprocal dynamic shaping sexual risk outcomes in digital contexts. Strengthening both sexual health literacy and self-regulation is therefore crucial for developing comprehensive interventions aimed at promoting safe, responsible, and adaptive sexual behaviors among online dating users.

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