Salud, Ciencia y Tecnología. 2025; 5:2066
doi: 10.56294/saludcyt20252066

ORIGINAL

Junior High Students' Awareness Assessment of Narcotics, Psychotropics, and Addictive Substances Dangers in Bandung

Evaluación de la conciencia de los estudiantes de secundaria sobre los peligros de los narcóticos, psicotrópicos y sustancias adictivas en Bandung

Irpan Irpan[1], Subagyo[1], Muhammad Hamid Anwar[1], Sandey Tantra Paramitha[2], Sri Widianingsih[3], Eko Purnomo[4]

[1]Universitas Negeri Yogyakarta, Faculty of Sports Science. Yogyakarta, Indonesia.
[2]Universitas Pendidikan Indonesia, Faculty of Sports Education and Health. Bandung, Indonesia.
[3]STKIP Pasundan, Physical Education, Health, and Recreation. Cimahi, Indonesia.
[4]Universitas Negeri Padang, Faculty of Sports Science. Padang, Indonesia.

Cite as: Irpan I, Subagyo, Hamid Anwar M, Tantra Paramitha S, Widianingsih S, Purnomo E. Junior High Students' Awareness Assessment of Narcotics, Psychotropics, and Addictive Substances Dangers in Bandung. Salud, Ciencia y Tecnología. 2025; 5:2066. https://doi.org/10.56294/saludcyt20252066

Submitted: 18-03-2025 **Revised:** 14-06-2025 **Accepted:** 13-08-2025 **Published:** 14-08-2025

Editor: Prof. Dr. William Castillo-González

Corresponding Author: Eko Purnomo

ABSTRACT

Substance abuse amongst adolescents has become a serious issue requiring effective prevention strategies. Students' awareness of drug dangers serves as an important foundation in developing targeted preventive education programmers. This research aims to evaluate junior secondary school students' awareness levels regarding drug dangers in Bandung, analyze gender differences, and identify the most influential information sources. The study employed a descriptive survey design with quantitative approach. The research population involved 2400 junior secondary students (1750 females, 650 males) from 75 schools across Bandung. Data were collected using a validated questionnaire comprising 30 items measuring six awareness dimensions: knowledge of drug types, health impacts, social impacts, legal consequences, prevention & rehabilitation, and risk factors. Students' awareness levels ranged from moderate to high with mean scores of 3,36-3,76 (scale 1-5). The health impact dimension showed highest awareness (3,76), whilst prevention & rehabilitation was lowest (3,36). Gender analysis revealed significant differences ($p<0,001$) with female students consistently outperforming males across all dimensions, with the largest gap in social impacts (0,21). Schools emerged as the dominant information source (37,2 %), followed by family (27,0 %) and social media (19,0 %). Although general awareness levels were relatively good, critical areas requiring attention remain, particularly prevention and rehabilitation aspects. Significant gender differences imply the need for gender-sensitive education strategies. Schools' dominance as information sources confirms the vital role of educational institutions in comprehensive anti-drug programmers.

Keywords: NAPZA; Student Awareness; Junior Secondary Education; Gender Differences; Health Education; Drug Prevention.

RESUMEN

El abuso de sustancias entre los adolescentes se ha convertido en un problema grave que requiere estrategias de prevención eficaces. El conocimiento de los estudiantes sobre los peligros de las drogas constituye una base importante para el desarrollo de programas específicos de educación preventiva. Esta investigación tiene como objetivo evaluar los niveles de conocimiento de los estudiantes de secundaria básica sobre los peligros de las drogas en la ciudad de Bandung, analizar las diferencias de género e identificar las fuentes de información más influyentes.

El estudio empleó un diseño de encuesta descriptiva con enfoque cuantitativo. La población de la investigación involucró a 2400 estudiantes de secundaria básica (1750 mujeres, 650 hombres) de 75 escuelas de la ciudad de Bandung. Los datos se recopilaron mediante un cuestionario validado que consta de 30 ítems que miden seis dimensiones de conocimiento: conocimiento de los tipos de drogas, impactos en la salud, impactos sociales, consecuencias legales, prevención y rehabilitación, y factores de riesgo. Los niveles de conocimiento de los estudiantes variaron de moderados a altos, con puntuaciones medias de 3,36 a 3,76 (escala de 1 a 5). La dimensión de impacto en la salud mostró el mayor conocimiento (3,76), mientras que la de prevención y rehabilitación fue la más baja (3,36). El análisis de género reveló diferencias significativas (p<0,001), donde las estudiantes superaron consistentemente a los estudiantes en todas las dimensiones, con la mayor brecha en el impacto social (0,21). Las escuelas se posicionaron como la principal fuente de información (37,2 %), seguidas de la familia (27,0 %) y las redes sociales (19,0 %). Si bien los niveles generales de concienciación fueron relativamente buenos, persisten áreas críticas que requieren atención, en particular los aspectos de prevención y rehabilitación. Las significativas diferencias de género implican la necesidad de estrategias educativas con perspectiva de género. El predominio de las escuelas como fuentes de información confirma el papel vital de las instituciones educativas en los programas integrales antidrogas.

Palabras clave: NAPZA; Concienciación Estudiantil; Educación Secundaria Básica; Diferencias de Género; Educación para la Salud; Prevención de Drogas.

INTRODUCTION

The misuse of Narcotics, Psychotropics, and Addictive Substances (NAPZA) has become a serious global threat to public health, particularly amongst adolescents and young people. The World Health Organization reported that approximately 269 million people worldwide used drugs in 2018, with concerning increasing trends in the 15-64 age group.[1,2,3] This phenomenon not only impacts individuals' physical and mental health but also creates complex social, economic, and legal consequences for society as a whole.[4]

In Indonesia, NAPZA issues have reached alarming levels with prevalence rates continuing to increase year on year. According to the National Narcotics Agency's 2019 data, drug users in Indonesia reached 3,6 million people or approximately 1,8 % of the total population.[5,6] More worryingly, the student and university age group dominate 27 % of total users, indicating that educational institutions have become vulnerable areas for NAPZA penetration. This data suggests that adolescents, particularly secondary school students, are in highly vulnerable positions regarding exposure and experimentation with various dangerous substances.[7] The unique characteristics of adolescence, marked by identity searching, high curiosity, need for peer acceptance, and tendency towards risk-taking, make this population significantly at risk for NAPZA misuse.[8,9] Neuropsychological research shows that the prefrontal cortex responsible for executive function and decision-making is not fully mature during adolescence, whilst the limbic system regulating reward and pleasure seeking is already optimally developed.[10,11] This neurobiological developmental imbalance creates a "window of vulnerability" making adolescents more susceptible to risky behavior, including NAPZA experimentation.[12]

Within physical and health education contexts, comprehensive understanding of students' awareness levels regarding NAPZA dangers becomes a crucial foundation for developing effective prevention strategies.[13,14] Awareness encompasses not only factual knowledge about NAPZA types, but also deep understanding of multidimensional consequences including physical, mental, social, and legal aspects, as well as prevention and rehabilitation strategies. High awareness levels are expected to function as protective factors reducing students' probability of engaging in substance misuse behavior.[15,16] The factual conditions occurring in the field show significant disparities between prevention efforts undertaken and effectiveness levels achieved. According to a survey conducted by the University of Indonesia's Health Research Centre, junior secondary students' awareness levels regarding NAPZA dangers remain heterogeneous, with very wide variations amongst individuals, schools, and geographical regions.[17,18] The research revealed that whilst the majority of students (78 %) possess basic knowledge about NAPZA types, only 42 % have comprehensive understanding of working mechanisms and long-term consequences of substance use.[19]

Field realities also show that NAPZA information sources received by students are often fragmented and unintegrated. Data from the Ministry of Education and Culture indicates that 65 % of Indonesian secondary schools lack structured and continuous anti-NAPZA education programmers.[18,20] Most information received by students is sporadic, often only through occasional lectures or short campaigns that do not provide long-term impact on attitude and behavior change. More worryingly, research conducted by the Indonesian Institute for Health Research revealed that 23 % of junior secondary students in urban areas obtain NAPZA information from non-credible sources, such as unverified social media, peer groups with limited knowledge, or even individuals with direct substance misuse experience.[21,22] This creates potential misinformation that can be

more dangerous than complete absence of information, as it can build false perceptions about NAPZA use risks and consequences.[23,24]

From a gender perspective, empirical data shows consistent differences in awareness levels and risky behavior patterns between male and female students. Longitudinal research conducted by the Centre for Adolescent Health Studies (2019-2021) shows that female students generally demonstrate higher awareness levels towards health risks, but have greater vulnerability to peer pressure in social contexts.[25,26] Conversely, male students show higher tendencies to ignore long-term risk information and focus more on immediate gratification, increasing probability of risky substance experimentation. Indonesia's geographical reality consisting of thousands of islands with varying development levels also creates disparities in access to quality information and prevention programmers. Urban areas like Bandung have relatively better access to educational facilities and prevention programmers, but also face more complex challenges regarding NAPZA exposure and more diverse environmental risk factors.[27,28]

Based on international best practices and recommendations from global health organizations, ideal conditions that should be achieved in students' NAPZA awareness contexts encompass several comprehensive and integrated dimensions. The United Nations Office on Drugs and Crime in their Global Standards for Drug Prevention guidance emphasizes that effective prevention programmers must be based on evidence-based interventions empirically proven to reduce risk factors and strengthen protective factors in target populations.[29,30] Ideally, every junior secondary student should possess high and comprehensive NAPZA awareness encompassing six main dimensions: (1) accurate factual knowledge about NAPZA types and working mechanisms, (2) deep understanding of short and long-term physical and mental health consequences, (3) awareness of social impacts including interpersonal relationship damage, social stigma, and consequences for academic and career futures, (4) comprehensive understanding of legal implications and applicable judicial systems, (5) practical knowledge of primary, secondary, and tertiary prevention strategies and rehabilitation processes, and (6) ability to identify and manage risk factors in personal and social environments.[31,32]

From an educational system perspective, ideal conditions require systematic and continuous anti-NAPZA material integration in formal curricula, not merely as side topics in certain subjects.[33,34] The approach that should be adopted is cross-curricular integration allowing concept reinforcement through various subjects such as Physical Education, Sports and Health, Natural Sciences, Civic Education, and even Indonesian Language through anti-NAPZA themed literary analysis. Ideally, every teacher involved in anti-NAPZA education should possess adequate competency not only in content mastery, but also in learning methodologies appropriate to adolescent developmental characteristics.[35,36,37] This includes ability to use interactive teaching methods, technology-enhanced learning, peer-to-peer education, and experiential learning that can increase student engagement and information retention.[38,39]

From family involvement perspectives, ideal conditions require strong synergy between school programmers and education provided in family environments.[40,41] Parents should possess adequate knowledge and communication skills to conduct productive and non-judgmental discussions with their children about NAPZA topics.[42,43] This requires systematic and continuous parent education programmers that can equip parents with knowledge, skills, and confidence to become effective partners in prevention efforts. In technology and media contexts, ideal conditions require strict content curation to ensure NAPZA information circulating on digital platforms is accurate, age-appropriate, and evidence-based.[44,45] Social media platforms should have mechanisms to promote positive educational content and reduce exposure to content that can trigger curiosity or normalize NAPZA use.[46,45,47,48]

In this context, research on evaluating junior secondary students' awareness levels regarding NAPZA dangers in Bandung becomes highly urgent and strategic. Bandung, as one of Indonesia's largest metropolitan areas with heterogeneous demographic characteristics and complex social dynamics, can serve as a representative case study providing valuable insights for developing more effective and scalable prevention strategies.[49,50] This research is expected to identify students' current awareness states comprehensively and multidimensionally, analyze factors influencing awareness level variations amongst individuals and groups, and provide evidence-based recommendations for developing more targeted and effective education programmers.[51,52] Involving 2,400 students from 75 schools, this research possesses adequate statistical power to generate generalizable and actionable findings.

Furthermore, this research is also expected to contribute to the body of knowledge in health education and adolescent development fields, particularly within Indonesian cultural and educational system contexts.[53,54] Research findings can become valuable baseline data for future longitudinal studies and comparative research that can enrich understanding of various intervention strategy effectiveness in different contexts.

To obtain a comprehensive picture of the actual and ideal levels of student awareness of the dangers of narcotics, a gap analysis was conducted between the actual level (Das Sein) and the ideal level (Das Sollen) based on six key dimensions of awareness. The results of this analysis illustrate the extent to which students' current understanding compares with the expected ideal standard. This data visualization can be seen in figure 1 and table 1 below.

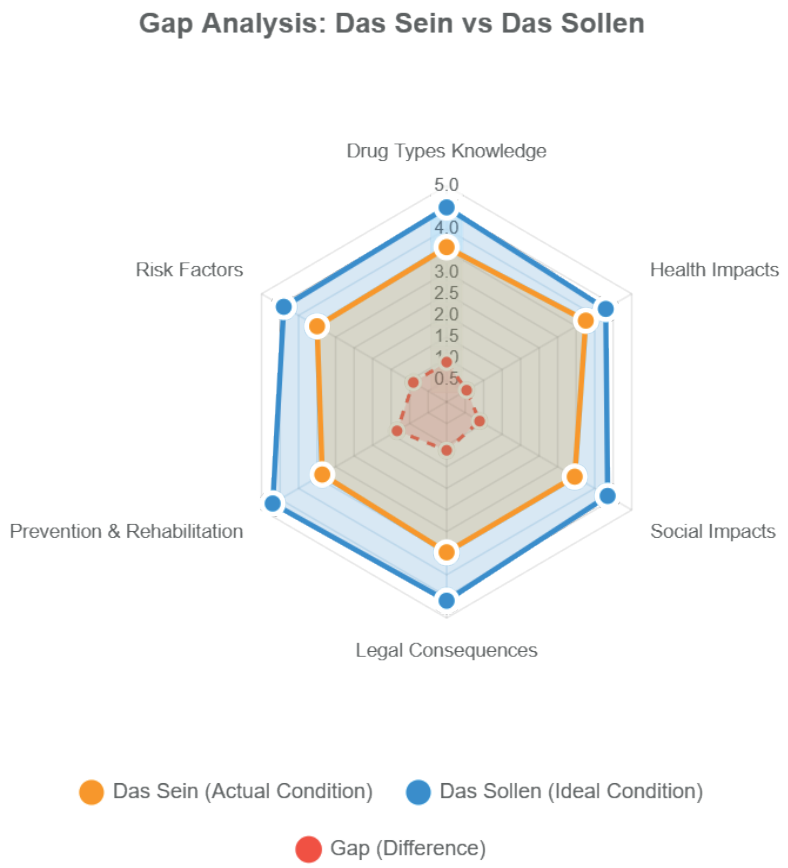

Figure 1. Gap Analysis Das Sein vs Das Sollen

This image presents a graphical comparison between the actual (orange) and ideal (blue) levels of student awareness across six dimensions: knowledge of drug types, health impacts, social impacts, legal consequences, risk factors, and prevention and rehabilitation efforts. The red area shows the gap between the two. The largest gaps are clearly visible in the Legal Consequences and Prevention & Rehabilitation dimensions, indicating that students' understanding of the law and prevention efforts is still far from ideal. This visualization highlights areas requiring more intensive attention and educational intervention.

Table 1. Comparison of Actual Conditions (Das Sein) vs Ideal Conditions (Das Sollen)

Awareness Dimension	Das Sein (Actual Condition)	Das Sollen (Ideal Condition)	Gap (Difference)	Achievement Percentage (%)	Intervention Priority
Health Impacts	3,76	4,30	0,54	87,4	Moderate
Knowledge of NAPZA Types	3,58	4,50	0,92	79,6	High
Risk factors	3,50	4,40	0,90	79,5	High
Legal consequences	3,48	4,60	1,12	75,7	Very high
Social impacts	3,46	4,35	0,89	79,5	High
Prevention & rehabilitation	3,36	4,70	1,34	71,5	Very high
Overall mean	3,52	4,48	0,96	78,6	-

Note: Scale 1-5 | Blue = Ideal targets based on international best practices | Green = Best achievement | Red = Largest gaps

This table details the average score for each dimension of awareness, comparing the actual and ideal levels, along with the calculation of the gap, percentage achievement, and determination of intervention priorities. The dimension with the highest achievement is Health Impacts (87,4 %), which requires moderate intervention. Conversely, Legal Consequences and Prevention & Rehabilitation show low achievement (75,7 % and 71,5 %) and are categorized as very high intervention priorities. This table provides a strong basis for policymaking and the development of more targeted drug education programs in schools.

METHOD

Research Design

The study involved a total population of 2400 junior secondary school students, comprising 1750 female students and 650 male students. These students were drawn from 75 different schools located across the city of Bandung. A descriptive survey method with a quantitative approach was employed to obtain a broad and objective understanding of the phenomenon under study, as outlined. Data collection was conducted using a validated questionnaire consisting of 30 items, designed to ensure the reliability and accuracy of the responses gathered from the participants. Research Methodology Description This research employed a descriptive survey design with quantitative approach based on Creswell's research methodology framework emphasizing systematic investigation to describe population or phenomena characteristics under study.[55,56] The selection of descriptive survey design was based on research objectives to identify, measure, and describe junior secondary students' NAPZA awareness levels comprehensively and objectively.

Research Sample

The research population encompassed all Junior Secondary School students in Bandung registered in the 2024/2025 academic year. The sampling technique used was multistage cluster sampling with the following stages: (1) school stratification based on status (state/private) and geographical zones, (2) proportional random sampling to select 75 schools from 198 total junior secondary schools in Bandung, and (3) systematic random sampling to select 32 students per school.[57,58] The total sample obtained was 2400 students comprising 1750 female students (72,9 %) and 650 male students (27,1 %), reflecting natural gender distribution in Bandung junior secondary population.

Data Collection

Data were collected using structured questionnaires developed based on Health Belief Model and Theory of Planned Behavior theoretical frameworks (55). The instrument comprised 30 items measuring six NAPZA awareness dimensions: (1) knowledge of NAPZA types (5 items), (2) health impacts (6 items), (3) social impacts (5 items), (4) legal consequences (4 items), (5) prevention and rehabilitation (5 items), and (6) risk factors (5 items). Each item used a 5-point Likert scale (1=strongly disagree to 5=strongly agree). Instrument validity was tested through expert judgement from three health education experts and underwent pilot testing on 120 junior secondary students outside the research sample with Cronbach's Alpha reliability results = 0,892, indicating excellent internal consistency.

Data collection was conducted during March-May 2024 with strict protocols to ensure standardization and data quality. Each school was visited by trained research teams comprising two enumerators with health education backgrounds. Questionnaire administration was conducted in classroom settings lasting 45 minutes, preceded by research purpose explanations and informed consent. To ensure anonymity and reduce social desirability bias, students were asked not to include personal identities and given data confidentiality assurance. The response rate achieved reached 96,8 %, indicating very good participation levels.

To ensure anonymity and reduce social desirability bias, students were asked not to include personal identities and given data confidentiality assurance.

In addition to anonymity, enumerators were trained to use neutral and non-judgmental language during questionnaire administration, and students were clearly informed that there were no "right" or "wrong" answers. This strategy aimed to minimize social desirability bias and encourage honest responses.

Research Instruments

Table 2. summary of the questionnaire's

Dimension	Number of Items	Sample Item
Knowledge of NAPZA Types	5	"I can differentiate between narcotics, psychotropics, and other addictive substances."
Health Impacts	6	"Using NAPZA can damage vital organs such as the brain and liver."
Social Impacts	5	"NAPZA abuse can ruin family and peer relationships."
Legal Consequences	4	"NAPZA users and dealers can be subject to imprisonment under Indonesian law."
Prevention & Rehabilitation	5	"There are official institutions that offer help for people wanting to quit using NAPZA."
Risk Factors	5	"Being in a peer group that uses NAPZA increases the chance of trying it."

Note: Each item was measured using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The questionnaire used in this study was self-developed based on constructs adapted from the Health Belief Model and Theory of Planned Behavior, rather than adopted directly from an existing standardized tool. The development process included extensive literature review, expert validation, and pilot testing. A summary of the questionnaire's structure is presented in table 2.

Data Analysis

Collected data were analyzed using SPSS version 26,0 software with the following stages: (1) descriptive analysis to describe frequency distributions and measures of central tendency for each awareness dimension, (2) normality testing using Kolmogorov-Smirnov test, (3) comparative analysis using independent samples t-test to compare awareness level differences based on gender, and (4) Pearson correlation analysis to explore relationships amongst awareness dimensions.[55] Awareness score interpretation was categorized based on cut-off points: very low (1,00-1,80), low (1,81-2,60), moderate (2,61-3,40), high (3,41-4,20), and very high (4,21-5,00). Statistical significance level was set at $\alpha = 0,05$ for all hypothesis testing.

RESULTS

Overall awareness level analysis reveals varied profiles but demonstrates relatively solid knowledge foundations. Awareness score distribution shows majority of students in moderate to high categories, with mean scores ranging from 3,36 to 3,76 from maximum scale 5,0.[59] These findings indicate that educational efforts undertaken by various parties, particularly educational institutions, have provided positive impact in building basic awareness about NAPZA dangers amongst junior secondary students.

The awareness dimension showing highest achievement is knowledge of health impacts with mean score 3,76. As many as 61 % of students were in high and very high categories for this dimension, reflecting effectiveness of health education approaches emphasizing physical and mental consequences of NAPZA misuse.[60,61] High awareness in health aspects can be explained through several factors, including: more concrete and easily understood nature of health information, health material integration in various subjects such as Science and Physical Education,[61] and public health campaigns often using striking and memorable visualizations of physical impacts.[62]

Knowledge about NAPZA types occupies second position with mean score 3,58, where 52,7 % of students show high to very high knowledge levels. Although majority of students possess basic understanding about classification and characteristics of various NAPZA types, 18,6 % of students still show low to very low knowledge. This gap indicates need for strengthening education about identifying various NAPZA forms and names, understanding differences between narcotics, psychotropics, and other addictive substances, and introduction to emerging drugs or new forms of NAPZA that continue developing.[63,64]

Awareness of risk factors that can increase NAPZA misuse probability shows mean score 3,50, with 49,7 % of students in high to very high categories. These findings show students have moderate understanding of situations and conditions that can increase NAPZA vulnerability.[17,65] However, need remains to strengthen understanding of more complex risk factors, such as peer pressure dynamics, dysfunctional family environment conditions, individual factors like stress management and self-esteem, and situational factors such as easy access and excessive academic pressure.

The awareness dimension regarding legal consequences shows results requiring special attention with mean score 3,48. As many as 23,5 % of students have low to very low awareness levels about legal aspects of NAPZA misuse.[66] This condition is quite concerning considering understanding of legal implications should be one of effective deterrent factors. Low awareness in this dimension reflects minimal socialization about Law No. 35 of 2009 concerning Narcotics, lack of understanding about criminal sanctions and mandatory rehabilitation programmers, and gaps in education about judicial processes applicable to NAPZA cases.

Awareness of social impacts from NAPZA misuse is in moderate category with mean score 3,46, where only 47 % of students show high to very high awareness levels. These findings indicate need for strengthening understanding of relational consequences and social costs of NAPZA misuse.[37,67] Areas requiring special attention include impacts on family and friendship relationships, consequences for academic achievement and career futures, social stigma and community isolation experienced by users and their families, and economic burden borne by families in rehabilitation and recovery processes.

The dimension showing lowest awareness level is knowledge of prevention and rehabilitation with mean score 3,36. Only 42,8 % of students were in high to very high categories, whilst 23,8 % of students show low to very low knowledge.[68,69] This finding is crucial because knowledge of prevention strategies is the main key in effective preventive efforts. Identified knowledge gaps include understanding of primary (preventing first use), secondary (early intervention), and tertiary (preventing relapse) prevention strategies, knowledge of available rehabilitation processes and stages, understanding of family and community roles in supporting recovery processes, and information about accessible counselling services and support systems.[70,71]

Gender difference analysis reveals highly significant and consistent findings across all awareness dimensions.

Female students show statistically significantly higher awareness levels compared to male students ($p < 0,001$) across all six measured dimensions. Most striking differences occurred in social impact dimensions with 0,21-point difference (females: 3,52, males: 3,31), followed by risk factor dimensions with 0,19-point difference (females: 3,56, males: 3,37). Consistency of gender differences indicates systematic factors influencing awareness patterns, explainable through differences in neurobiological development, gender socialization processes, and different risk perception characteristics between male and female adolescents.[72,73,74]

Information source analysis reveals clear dominance of formal sources in forming students' NAPZA awareness. Schools become the most influential information source with 37,2 % contribution, showing central role of educational institutions in anti-NAPZA education.[75] Schools' dominant position can be explained through several structural factors such as captive audience allowing mandatory exposure to material, systematic delivery through structured curricula, multiple touchpoints through various subjects, and peer reinforcement through classroom discussions strengthening information retention.

Families occupy second position as information source with 27,0 % contribution, reflecting continued relevance of family roles in Indonesian cultural contexts.[76,77] However, 10,2 % gap with schools indicates challenges in optimizing family roles, including limitations in parents' knowledge about latest developments in NAPZA world, lack of effective communication skills to discuss sensitive topics with adolescents, and variations in comfort levels and parenting styles affecting family discussion openness.[78,79]

An interesting phenomenon identified is social media and internet contribution as third information source with 19,0 %. This high figure reflects digital native generation reality highly dependent on online platforms for obtaining information.[80] However, social media dominance also presents significant risks regarding information quality and accuracy, considering digital information characteristics often unfiltered, biased due to algorithms, tend towards sensationalism to increase engagement, and susceptible to misinformation that can form wrong perceptions about NAPZA.[81,82]

Table 3. Research subject profile based on population

Information	Amount
Number of Respondents	2400
Number of Schools	75
Male Sample	27,1 %
Female Sample	72,9 %

As research that reveals quantitative data, the documentation process attached to this article discusses the interpretation of research data which we then analyze according to considerations based on research methods. The study related to this matter will be discussed as follows.

Table 4. Distribution of Student Awareness Levels by NAPZA Knowledge Dimensions

Knowledge Dimension	Very High (%)	High (%)	Moderate (%)	Low (%)	Very Low (%)	Mean Score
Knowledge of NAPZA Types	18,5	34,2	28,7	13,8	4,8	3,58
Health Impacts	22,1	38,9	25,4	10,2	3,4	3,76
Social Impacts	15,3	31,7	32,1	15,6	5,3	3,46
Legal Consequences	19,8	29,4	27,3	16,7	6,8	3,48
Prevention & Rehabilitation	14,2	28,6	33,4	17,1	6,7	3,36
Risk Factors	16,9	32,8	29,7	14,3	6,3	3,50

This dimension shows highest awareness level with 61 % of students in high-very high categories. Findings indicate junior secondary students have relatively good understanding of physical and mental consequences of NAPZA use, such as organ damage, neurological disorders, and mental health problems. High awareness in this dimension likely results from; 1) more concrete and easily understood health information; 2) health material exposure in Science and Physical Education subjects; 3) health campaigns often using striking physical impact visuals.

With 52,7 % of students in high-very high categories, this shows fairly good understanding of NAPZA classification and types. However, 18,6 % of students still have low-very low knowledge, indicating need for strengthening education about: 1) Identifying various NAPZA forms and names; 2) Differences between narcotics, psychotropics, and other addictive substances: 3) Recognition of new forms of NAPZA (synthetic drugs).

The dimension Prevention & Rehabilitation Dimension shows lowest awareness level with 23,8 % of students having low-very low knowledge. This finding is crucial because prevention knowledge is the main key in effective preventive strategies. Areas needing attention include; Primary, secondary, and tertiary prevention strategies; Rehabilitation processes and stages Family and community roles in prevention; Available counselling services and support systems

Table 5. Comparison of Awareness Levels by Gender

Dimension	Female (n=1750)	Male (n=650)	Sig. (p-value)
Knowledge of NAPZA Types	3,62 ± 0,89	3,48 ± 0,94	0,001*
Health Impacts	3,81 ± 0,87	3,65 ± 0,91	0,000*
Social Impacts	3,52 ± 0,93	3,31 ± 0,96	0,000*
Legal Consequences	3,53 ± 0,95	3,36 ± 0,98	0,000*
Prevention & Rehabilitation	3,41 ± 0,92	3,23 ± 0,95	0,000*
Risk Factors	3,56 ± 0,90	3,37 ± 0,94	0,000*

Note: *Significant at α = 0,05

Analysis results show very significant differences ($p < 0,001$) between female and male students across all six NAPZA awareness dimensions. Female students consistently demonstrate higher awareness levels with mean differences ranging from 0,14 to 0,21 points. This consistency indicates systematic factors influencing gender differences in NAPZA awareness. Most significant difference occurs in social impact dimension, where females (3,52) outperform males (3,31). This can be explained through; Social sensitivity females generally more sensitive to social and relational consequences and Empathy development: Neuropsychological research shows female adolescents develop social empathy earlier. Social conformity: Females tend to be more aware of social norms and stigma

Females (3,56) show higher awareness of risk factors compared to males (3,37). This finding is significant because; 1) Risk perception: Females generally more risk-averse with more accurate risk perception; 2) Self-protection behavior: Female tendency to be more cautious in risky situations3) Peer influence awareness: Females more aware of peer group dynamics

Based on gender difference findings, differentiated education strategies are need to utilizing already high awareness as peer educators and role models, whilst strengthening areas still needing improvement. Using more direct, competitive, and logic-based approaches with emphasis on achievement and goal-oriented aspects. It will be important to creating dynamic learning utilizing each gender's strengths to complement each other

Table 6. Most Influential NAPZA Information Sources

Information Source	Frequency	Percentage (%)	Ranking
Teachers/School	892	37,2	1
Parents/Family	648	27,0	2
Social media/Internet	456	19,0	3
Television/Mass media	236	9,8	4
Friends/Peers	120	5,0	5
Health personnel	48	2,0	6

Combined teachers/schools (37,2 %) and parents/family (27,0 %) dominate as primary information sources totaling 64,2 %. This finding confirms formal system effectiveness in anti-NAPZA education and shows junior secondary students still highly dependent on authority figures for health information. Schools become dominant information source, surpassing even parental roles. This finding is significant will describe below here.

Several structural factors contribute to the effectiveness of schools as a primary channel for NAPZA education. One key advantage is the presence of a captive audience—students are required to attend school and are thus consistently exposed to educational material, including topics related to NAPZA. This mandatory attendance ensures that awareness efforts reach a broad and consistent population. In addition, the structured nature of the school curriculum allows for systematic and organized delivery of information, making it easier to plan and implement educational interventions. The presence of multiple touchpoints across various subjects, such as science, health, and civic education, enables the integration of NAPZA-related content into different learning contexts, thereby reinforcing key messages. Furthermore, peer interactions within the classroom setting play a supportive role; discussions and collaborative activities among students help to reinforce and internalize

the information presented, enhancing both retention and understanding. Digital Phenomenon: Social Media/ Internet (19,0 %).

Considering school dominance (37,2 %), strategies needed to maximize effectiveness through teacher capacity building, curriculum integration, and interactive pedagogy. To increase family contribution from 27,0 % through parent education programmers, communication training, and support groups. Considering 19,0 % of students receive information from social media/internet, comprehensive strategies needed including digital literacy education, positive content creation, and misinformation monitoring.

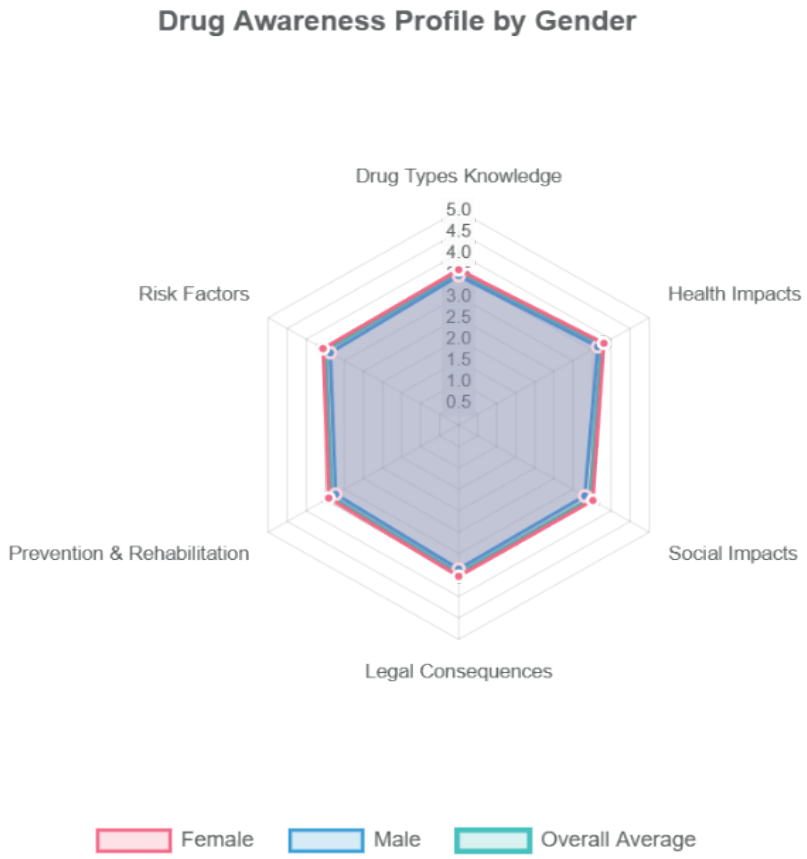

Figure 2. Radar Chart: NAPZA Awareness Profile of Junior Secondary Students in Bandung

Table 7. NAPZA Awareness Profile Data by Dimension and Gender

Awareness Dimension	Female (n=1,750)	Male (n=650)	Overall Mean	Difference (F-M)	Overall Category
Health Impacts	3,81	3,65	3,76	0,16	High
Knowledge of NAPZA Types	3,62	3,48	3,58	0,14	High
Risk Factors	3,56	3,37	3,50	0,19	High
Legal Consequences	3,53	3,36	3,48	0,17	Moderate-High
Social Impacts	3,52	3,31	3,46	0,21	Moderate-High
Prevention & Rehabilitation	3,41	3,23	3,36	0,18	Moderate

Note: Scale 1-5 (1=Very Low, 2=Low, 3=Moderate, 4=High, 5=Very High) Green color = highest scores, pink = attention areas, orange = largest gender gap

DISCUSSION

Research results show junior secondary students' awareness levels in Bandung regarding NAPZA dangers are in moderate to high categories with mean scores ranging from 3,36-3,76 on scale 5. The "Health Impacts" dimension achieved highest score (3,76), showing students have relatively good understanding of health consequences from NAPZA use. The health impacts were generally more recognized by adolescents compared to other aspects, as reported in previous findings.[65,83] The effectiveness of school-based education programs in delivering concrete and easily understood health information was also highlighted in previous studies.[65]

Analysis shows significant differences ($p < 0,001$) between female and male students across all awareness dimensions. Female students consistently demonstrate higher awareness levels. The tendency of female adolescents to be more risk-averse and exhibit higher awareness toward dangerous substances has also been demonstrated in meta-analytic studies.[84] This is further supported by neurobiological evidence indicating that the development of the prefrontal cortex, which regulates executive function and risk assessment, occurs earlier in females—potentially explaining their superior risk perception and NAPZA-related decision-making.[85]

Teachers and schools become primary information sources (37,2 %), followed by parents/family (27,0 %). These findings underscore importance of formal education and family roles in anti-NAPZA education.[86] The dominance of schools as a primary source of information is consistent with findings indicating that educational institutions possess superior structural capacity to systematically deliver health information.[87,88] However, high social media influence (19,0 %) shows need for more effective digital literacy strategies,[82] considering misinformation risks that can influence students' NAPZA perceptions.[89]

The "Prevention & Rehabilitation" dimension achieved lowest score (3,36), indicating need for strengthening education about prevention mechanisms and rehabilitation processes. This is crucial because prevention understanding is the main key in preventive strategies. The higher effectiveness of peer education programs focusing on prevention strategies, compared to conventional approaches that solely emphasize the negative impacts of NAPZA, has been confirmed by previous research.[90,91]

The findings of the study indicate that junior secondary students in Bandung generally exhibit a moderate to high level of awareness regarding NAPZA (narcotics, psychotropics, and other addictive substances). However, this awareness is not evenly distributed across all dimensions. In particular, students demonstrate lower levels of understanding in the areas of prevention and knowledge of risk factors, suggesting that while basic awareness exists, there is still substantial room for targeted improvement. Notably, the study also reveals a consistent gender gap, with female students showing significantly higher awareness across all measured aspects compared to their male counterparts. This disparity highlights the need for educational approaches that are sensitive to gender differences, particularly in terms of learning preferences and engagement styles. Furthermore, schools were identified as the dominant and most trusted source of NAPZA-related information, reinforcing the importance of formal education in prevention efforts. However, the heavy reliance on schools also points to the necessity of diversifying educational approaches to enhance the reach and effectiveness of NAPZA education.

These findings have several implications for policy and practice. One important recommendation is the integration of anti-NAPZA content into the existing Physical Education, Sports, and Health curriculum, using a more comprehensive and contextualized approach that includes both preventive strategies and awareness of rehabilitation processes. Given the observed gender differences, it is essential that future education programmers consider the unique learning characteristics of male and female students, employing more interactive and engaging methods for male students to increase their involvement and understanding. In addition to school-based efforts, the role of parents and families should also be strengthened. Since families are identified as a significant source of information, parenting education programmers focused on NAPZA topics are crucial to provide parents with the necessary knowledge and communication skills to guide their children effectively. Moreover, in response to the increasing influence of digital media, there is a growing need to promote digital literacy among students. Such programmers should help students critically assess and verify NAPZA-related information they encounter on the internet and social media platforms.

Despite these practical implications, the study has certain methodological limitations that should be acknowledged. First, the cross-sectional design limits the ability to determine causality or changes in awareness over time. Second, the use of self-reported data introduces the potential for bias, including social desirability effects and inaccurate recall. Third, the absence of external validation, such as triangulating findings with teacher assessments or behavioral observations, limits the robustness of the conclusions. Future research is encouraged to address these limitations by employing longitudinal designs and incorporating multiple data sources for cross-validation.

In addition, the practical implications of this study should be translated into more concrete strategies. For schools, this includes embedding anti-NAPZA education into daily learning activities, implementing structured training for teachers on interactive teaching methods, and initiating peer-led awareness campaigns, particularly using female students as role models. For families, this includes parenting workshops, user-friendly resource kits, and parent support groups to strengthen communication skills and knowledge related to NAPZA topics.

To further enrich the findings, qualitative follow-up research is also strongly recommended. Methods such as focus group discussions and in-depth interviews with students, teachers, and parents can uncover the deeper socio-cultural and psychological factors behind the observed gaps in awareness. This is particularly crucial to understand why dimensions such as prevention and legal consequences consistently receive lower scores and how communication strategies can be better tailored to adolescents' developmental and contextual realities.

To build on the current findings, future research is recommended in several areas. Longitudinal studies are needed to assess the long-term effectiveness of anti-NAPZA educational interventions, determining whether

improvements in awareness lead to sustained behavioral changes over time. Qualitative research methods, such as focus group discussions and in-depth interviews, would be valuable in exploring the factors behind the observed gender differences in awareness and attitudes. Additionally, future studies should focus on developing and evaluating tailored intervention models that are appropriate for the developmental stage and cultural context of junior secondary students. These models should aim to improve the effectiveness and adaptability of NAPZA education across diverse educational settings.

Developing anti-NAPZA curricula integrated across subjects with special emphasis on prevention and legal consequence dimensions.[61,92] Implementing teacher capacity building through comprehensive training programmers on interactive learning methodologies, educational technology use, and effective communication strategies with adolescents.[93] Establishing peer educator programmers utilizing female students as role models whilst developing more engaging special approaches for male students.[94]

Formulating minimum competency standards for teachers in anti-NAPZA education as professional certification requirements.[95] Developing assessment tools measuring not only factual knowledge but also student attitudes and behavioral intentions towards NAPZA.[37] Establishing cross-sector task forces involving Education Department, BNN, Police, and Health Department for coordinating synergistic and continuous prevention programmers.[37]

Organizing parenting education programmers focusing on improving parents' knowledge base about latest NAPZA developments and effective communication skills with adolescents.[42] Providing user-friendly resource kits to facilitate productive family discussions about NAPZA topics.[30] Establishing parent support groups for sharing experiences and best practices in anti-NAPZA education in family environments.[96]

Developing digital literacy programmers teaching critical evaluation skills to assess NAPZA information validity on online platforms.[97,98] Collaborating with social media platforms for content curation promoting accurate information and reducing exposure to content that can trigger curiosity or normalize NAPZA use.[99] Creating engaging and shareable educational content for counter-narratives against misinformation in digital spaces.[100]

Conducting longitudinal studies to measure long-term effectiveness of intervention programmers developed based on these research findings.[101] In-depth qualitative research through focus group discussions and in-depth interviews to explore underlying factors influencing gender awareness differences and identify best practices in anti-NAPZA communication resonating with contemporary adolescent characteristics.[102,103]

CONCLUSIONS

Based on research results from 2400 junior secondary students across 75 schools in Bandung, it can be concluded that students' awareness levels regarding NAPZA dangers are generally in moderate to high categories with mean scores 3,36-3,76 on scale 5. These findings indicate basic NAPZA knowledge foundations have formed relatively well amongst junior secondary students, but critical areas requiring significant strengthening remain.

Awareness dimensions show clear hierarchy, with health impacts occupying highest position (3,76), followed by knowledge of NAPZA types (3,58), risk factors (3,50), legal consequences (3,48), social impacts (3,46), and prevention & rehabilitation as lowest dimension (3,36). This pattern reflects students more easily understand concrete aspects like physical impacts, but experience difficulties understanding abstract concepts like prevention strategies and rehabilitation processes.

Gender analysis reveals very significant differences ($p < 0,001$) with female students consistently outperforming male students across all awareness dimensions. Largest gaps occur in social impact dimensions (0,21) and risk factors (0,19), indicating females have higher sensitivity towards relational consequences and better risk assessment abilities. These systematic differences show need for education approaches considering gender-based characteristics and learning preferences.

Information source ecosystem is dominated by formal institutions, with schools occupying central position (37,2 %) as primary source, followed by family (27,0 %) and social media/internet (19,0 %). School dominance confirms crucial role of educational institutions in forming anti-NAPZA awareness, but social media's significant contribution also presents new challenges regarding quality and validity of information received by students.

Gap analysis between actual conditions (das sein) and ideal conditions (das sollen) shows average deficit of 21,4 % with achievement level 78,6 % of international standards. Areas requiring highest intervention priority are prevention & rehabilitation (gap 1,34) and legal consequences (gap 1,12), reflecting systemic weaknesses in education about preventive aspects and legal awareness.

The findings of this study have important strategic implications for the formulation of national and regional education policies, particularly in designing health education and drug abuse prevention curricula that are more contextual, measurable, and responsive to student characteristics. The gap between actual and ideal conditions identified in this study demonstrates the need to integrate an evidence-based approach into prevention education policies, by strengthening the legal, preventive, and rehabilitative dimensions of teaching materials at the junior high school level.

Furthermore, the awareness assessment model used in this study has the potential to be widely replicated in other cities in Indonesia with different social and cultural characteristics, to obtain a more comprehensive and comparative mapping of national awareness. This approach can even be adapted for use in international contexts, particularly in developing countries facing similar challenges in educating and educating adolescents about the dangers of drugs. Thus, the results of this study serve not only as a basis for local interventions but also as an important contributor to the global agenda of protecting young people from the threat of substance abuse.

BIBLIOGRAPHC REFERENCES

1. Noble B, Adjei. Substance use and adolescent injuries: a multi-country analysis of the association and mediating effect of interpersonal violence among 122,945 in-school paediatric populations in 29 countries. 2023. https://www.frontiersin.org/articles/10.3389/fpubh.2023.1193711

2. Belfiore CI, Galofaro V, Cotroneo D, Lopis A, Tringali I, Denaro V, et al. A Multi-Level Analysis of Biological, Social, and Psychological Determinants of Substance Use Disorder and Co-Occurring Mental Health Outcomes. Psychoactives. 2024 Apr 8;3(2):194. https://doi.org/10.3390/psychoactives3020013

3. Labzai A, Kouidere A, Khajji B, Balatif O, Rachik M. Mathematical Modeling and Optimal Control Strategy for a Discrete Time Drug Consumption Model. Discrete Dynamics in Nature and Society. 2020 Aug 6;2020:1. https://doi.org/10.1155/2020/5671493

4. Jamshidi F, Nazari I, Rahimi Z, Cheraghi M. Pattern of drug abuse in addicts self-referred drug rehabilitation centers in Khuzestan province – Iran, 2014–2015. Archives of Forensic Medicine and Criminology. 2016 Jan 1;1:1. https://doi.org/10.5114/amsik.2016.62330

5. Lestari DN, Supriadi O, Waseh H. Implementation of Policy for Prevention and Eradication of Abuse and Illegal Circulation of Drugs and Precursors (P4GN) at The National Narcotics Agency of Tangerang City Rehabilitation Section. International Journal of Social Sciences Review. 2022 Oct 31;3(2):53. https://doi.org/10.57266/ijssr.v3i2.92

6. Tjangkung JV, Liliweri A, Ronda M. The Changes In Indonesian Police Organizational Communication Patterns In Increasing Community Participation Through The Qlue Reporting System (A Phenomenology Study On Drug Unit Of South Jakarta Metro Police). Zenodo (CERN European Organization for Nuclear Research). 2021 Jan 28; https://zenodo.org/record/4595974

7. Negro F, Trana AD, Marinelli S. The effects of the COVID-19 pandemic on the use of the performance-enhancing drugs. PubMed. 2022 Jan 19;92(6). https://pubmed.ncbi.nlm.nih.gov/35075058

8. Zhu C, Huang S, Evans R, Zhang W. Cyberbullying Among Adolescents and Children: A Comprehensive Review of the Global Situation, Risk Factors, and Preventive Measures. Frontiers in Public Health. Frontiers Media; 2021 Mar 11;9. https://doi.org/10.3389/fpubh.2021.634909

9. Saladino V, Mosca O, Petruccelli F, Hoelzlhammer L, Lauriola M, Verrastro V, et al. The Vicious Cycle: Problematic Family Relations, Substance Abuse, and Crime in Adolescence: A Narrative Review. Frontiers in Psychology. Frontiers Media; 2021 Jul 26;12. https://doi.org/10.3389/fpsyg.2021.673954

10. Rosenbaum G, Botdorf M, Patrianakos J, Steinberg L, Chein J. Working Memory Training in Adolescents Decreases Laboratory Risk Taking in the Presence of Peers. Journal of Cognitive Enhancement. 2017 Oct 23;1(4):513. https://doi.org/10.1007/s41465-017-0045-0

11. Paulus MP, Zhao Y, Potenza MN, Aupperle RL, Bagot K, Tapert SF. Screen media activity in youth: A critical review of mental health and neuroscience findings. Journal of Mood and Anxiety Disorders. Elsevier BV; 2023 Aug 11;3:100018. https://doi.org/10.1016/j.xjmad.2023.100018

12. McIlvain G, Clements RG, Magoon EM, Spielberg JM, Telzer EH, Johnson CL. Viscoelasticity of reward and control systems in adolescent risk taking. NeuroImage. 2020 Apr 14;215:116850. https://doi.org/10.1016/j.neuroimage.2020.116850

13. Needham BL, Crosnoe R, Muller C. Academic Failure in Secondary School: The Inter-Related Role of

Health Problems and Educational Context. Social Problems. 2004 Oct 21;51(4):569. https://doi.org/10.1525/sp.2004.51.4.569

14. Leblanc R, Drolet M, Ducharme D, Arcand I, Head R, Alphonse JR. The Conception of Risk in Minority Young Adolescents Aged 12-14 Years. Universal Journal of Educational Research. 2015 Jun 1;3(6):359. https://doi.org/10.13189/ujer.2015.030602

15. Kazdouh HE, El-Ammari A, Bouftini S, Fakir SE, Achhab YE. Adolescents, parents and teachers' perceptions of risk and protective factors of substance use in Moroccan adolescents: a qualitative study. Substance Abuse Treatment Prevention and Policy. 2018 Sep 10;13(1). https://doi.org/10.1186/s13011-018-0169-y

16. Nawi AM, İsmail R, Ibrahim F, Hassan MR, Manaf MRA, Amit N, et al. Risk and protective factors of drug abuse among adolescents: a systematic review. BMC Public Health. BioMed Central; 2021 Nov 13;21(1). https://doi.org/10.1186/s12889-021-11906-2

17. Kunwar S, Sharma S, Marasini S, Joshi A, Adhikari A, Ranjit A, et al. Cyberbullying and cyber-victimisation among higher secondary school adolescents in an urban city of Nepal: a cross-sectional study. BMJ Open. 2024;14.

18. Zarkomi MG, Basuki A, Sholihah F. The Use of Classical Guidance to Increase High School Students' Understanding About Drug Abuse. KnE Social Sciences. 2021 Dec 29; https://doi.org/10.18502/kss.v6i2.9993

19. Usman A, Abubakar AA, Sufiyan MB, Balogun MS, Awosan KJ, Raji IA, et al. Knowledge of health effects and determinants of psychoactive substance use among secondary school students in Sokoto Metropolis, Nigeria. Pan African Medical Journal. 2021 Jan 1;40. https://doi.org/10.11604/pamj.2021.40.109.22000

20. Mangku DGS, Yuliartini NPR. Combating Narcotics Abuse by Children in Buleleng Regency. Jurnal Magister Hukum Udayana (Udayana Master Law Journal). 2021 Jul 30;10(2):264. https://doi.org/10.24843/jmhu.2021.v10.i02.p06

21. Oktriyanto O, Amrullah H, Titisari AS. Family Function and Misuse of Drug in Adolescents in Indonesia. Jurnal Kesehatan Masyarakat. 2020 Nov 30;16(2):271. https://doi.org/10.15294/kemas.v16i2.23304

22. Shafie AAH, Othman K, Baharudin DF, Yasin NM, Amat S, Jaladin RAM, et al. An Analysis on Youth Drug Abuse: Protective and Risk Factors in High-Risk Area. Pertanika journal of social science & humanities. 2023 May 3;31(2):561. https://doi.org/10.47836/pjssh.31.2.07

23. Bujalski M, Wieczorek Ł, Sierosławski J. Risk perception and risk aversion among people who use New Psychoactive Substances. International Journal of Drug Policy. 2021 Jun 16;97:103326. https://doi.org/10.1016/j.drugpo.2021.103326

24. ElSherief M, Sumner SA, Krishnasamy V, Jones CM, Law R, Kacha-Ochana A, et al. Identification of Myths and Misinformation About Treatment for Opioid Use Disorder on Social Media: Infodemiology Study. JMIR Formative Research. 2023 Nov 1;8. https://doi.org/10.2196/44726

25. Patalay P, Fitzsimons E. Development and predictors of mental ill-health and wellbeing from childhood to adolescence. Social Psychiatry and Psychiatric Epidemiology. 2018 Sep 26;53(12):1311. https://doi.org/10.1007/s00127-018-1604-0

26. Wu T, Rose SE, Bancroft JM. Gender Differences in Health Risk Behaviors and Physical Activity Among Middle School Students. The Journal of School Nursing. 2006 Feb 1;22(1):25. https://doi.org/10.1177/10598405060220010501

27. Mukhoriyah M, Arifin S, Dewi EK, Silvia S. Analysis of Development Patterns of Built Land and Spatial Structure in Bandung City Using Landsat 8 Image Data. Jurnal Ilmu Lingkungan. 2021 Apr 28;19(1):36. https://doi.org/10.14710/jil.19.1.36-42

28. Vitriana A. The growth of Metropolitan Bandung Raya (MBR) and the increase of urban housing matters. In: IOP Conference Series Earth and Environmental Science. IOP Publishing; 2020. p. 12024. https://doi.org/10.1088/1755-1315/419/1/012024

29. Campello G, Sloboda Z, Heikkil H, Brotherhood A. International standards on drug use prevention: the future of drug use prevention world-wide. International Journal of Prevention and Treatment of Substance Use Disorders. 2014 Nov 26;1(2):6. https://doi.org/10.4038/ijptsud.v1i2.7687

30. Valentine J, De Jong JA, Kennedy NJ. Substance abuse prevention in multicultural communities. Substance Abuse Prevention in Multicultural Communities. Taylor and Francis; 2014. 171.

31. Servan AK, Mittelmark MB. Resources for coping among women ex-offenders. International Journal of Mental Health Promotion. 2012 Nov 1;14(5):254. https://doi.org/10.1080/14623730.2013.781871

32. Kameg B, Constantino RE. Intimate partner violence in adolescents: Preventive strategies for psychiatric-mental health nurse practitioners. Journal of Child and Adolescent Psychiatric Nursing. Wiley; 2020. https://doi.org/10.1111/jcap.12286

33. Rzymełka-Frąckiewicz A. Teachers as Key Professionals in Safeguarding Children and Young Adults Against Contemporary Threats. Annales Universitatis Mariae Curie-Skłodowska sectio J – Paedagogia-Psychologia. 2021 Apr 27;34(1):109. https://doi.org/10.17951/j.2021.34.1.109-117

34. Martiano M. Development of EDUDA as a Media to Build Students 'Self-Resistance in Preventing Drugs. Journal of Computer Science Information Technology and Telecommunication Engineering. 2021 Mar 30; https://doi.org/10.30596/jcositte.v2i1.6956

35. Muassomah M, Abdullah I, Istiadah I, Mujahidin A, Masnawi N, Sohrah S. Believe in Literature: Character Education for Indonesia's Youth. Universal Journal of Educational Research. 2020 Jun 1;8(6):2223. https://doi.org/10.13189/ujer.2020.080605

36. Panggua S, Wello B, Jabu B, Macdonald D. Self-Assessed Professional Competence of the High School EFL Teachers in Toraja Indonesia. International Journal of English Linguistics. 2017 Dec 23;8(2):25. https://doi.org/10.5539/ijel.v8n2p25

37. Kusnan A, Salma WO, Asriati A, Eso A, Kambu AY, Zulfikarrahim M. Training For The Prevention of Narcotics Abuse Among Students of Halu Oleo University. Mattawang Jurnal Pengabdian Masyarakat. 2022 Jun 12;3(2):132. https://doi.org/10.35877/454ri.mattawang806

38. Konopka CL, Adaime MB, Mosele PH. Active Teaching and Learning Methodologies: Some Considerations. Creative Education. 2015 Jan 1 6(14):1536. https://doi.org/10.4236/ce.2015.614154

39. Gutiérrez-García L, Salas JB, Sánchez-Martín J, Téllez TR. Cultural Sustainability in Ethnobotanical Research with Students Up to K-12. Sustainability. 2020 Jul 14 12(14):5664. https://doi.org/10.3390/su12145664

40. Stanley K, Kuo N. "It Takes a Village": Approaching the Development of School-Family-Community Partnerships through Bronfenbrenner's Socio-Ecological Perspectives. Journal of Human Sciences and Extension. 2022 Apr 21; https://doi.org/10.54718/cqbw6379

41. Schwenck CM, Pryor J. Student perspectives on camera usage to engage and connect in foundational education classes: It's time to turn your cameras on. International Journal of Educational Research Open. 2021 Jan 1;2:100079. https://doi.org/10.1016/j.ijedro.2021.100079

42. Griffin D. Parent involvement with African American families in expanded school mental health practice. Advances in School Mental Health Promotion. 2011;4:16.

43. Gomariz MÁ, Parra J, García-Sanz MP, Prados MÁH. Teaching Facilitation of Family Participation in Educational Institutions. Frontiers in Psychology. 2022 Feb 18;12. https://doi.org/10.3389/fpsyg.2021.748710

44. Fishbein D, Sloboda Z. A National Strategy for Preventing Substance and Opioid Use Disorders Through Evidence-Based Prevention Programming that Fosters Healthy Outcomes in Our Youth. Clinical Child and Family Psychology Review. Springer Science+Business Media; 2022 Dec 21;26(1):1. https://doi.org/10.1007/s10567-022-00420-5

45. Dorsey AG, Goffin SG, Guddemi M, Gulley B, Kalinowski M, Silvern SB, et al. National Association for the Education of Young Children. The SAGE Encyclopedia of Contemporary Early Childhood Education. 2016. https://doi.org/10.4135/9781483340333.n266

46. Mujtaba G, Khowaja SA, Dev K. EdgeAIGuard: Agentic LLMs for Minor Protection in Digital Spaces. IEEE Internet of Things Journal. 2025 Jan 1;1. https://doi.org/10.1109/jiot.2025.3574961

47. Shine D, Minehan M, Knight-Agarwal C. #Healthpromotion: A qualitative exploration of how dietitians can use social media to positively influence women aged 18–35 years. Nutrition & Dietetics. 2022 Sep 1;79(4):489. https://doi.org/10.1111/1747-0080.12765

48. Kington R, Arnesen SJ, Chou WS, Curry SJ, Lazer D, Villarruel AM. Identifying Credible Sources of Health Information in Social Media: Principles and Attributes. NAM Perspectives. 2021 Jul 15; https://doi.org/10.31478/202107a

49. Handayani W, Insani TD, Fisher MR, Gim TT, Mardhotillah S, Adam UEFB. Effects of COVID-19 restriction measures in Indonesia: A comparative spatial and policy analysis of selected urban agglomerations. International Journal of Disaster Risk Reduction. 2022 May 14 76:103015. https://doi.org/10.1016/j.ijdrr.2022.103015

50. Ardyati R, Ikrimah A. Optimising the national strategy for progressive employment absorption to ensure the rights and responsibilities of citizens in Indonesia. Jurnal Civics: Media Kajian Kewarganegaraan. 2025; https://api.semanticscholar.org/CorpusId:277730294

51. Ogata H. Supporting Awareness in Ubiquitous Learning. International Journal of Mobile and Blended Learning. 2009 Oct 1;1(4):1. https://doi.org/10.4018/jmbl.2009090801

52. Lackner M, Klamert-Schmid J, Zangl S, Neussner W, Lembacher H, Lutz M. Learning behavior of technical students – Awareness as key competence. Technium Romanian Journal of Applied Sciences and Technology. 2021 Sep 28;3(8):22. https://doi.org/10.47577/technium.v3i8.4476

53. Hidayati HN, Hayat B, Rahayu W. Assessment of the Validity and Reliability of Mental Health Instruments of High School Student in Indonesia. European Journal of Educational Research. 2021 Mar 20;729. https://doi.org/10.12973/eu-jer.10.2.729

54. Dewi FIR, Idulfilastri RM, Mar'at S, Bahiyah S. Resilience Modeling in Indonesian Adolescents: Associated with Quality of Life and Self-Esteem. In: Proceedings of the Tarumanagara International Conference on the Applications of Social Sciences and Humanities (TICASH 2019). 2020. https://doi.org/10.2991/assehr.k.200515.023

55. Creswell JW. Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research. 2001. http://ci.nii.ac.jp/ncid/BB26859968

56. Terrell SR. Mixed-Methods Research Methodologies. The Qualitative Report. 2015 Jan 20; https://doi.org/10.46743/2160-3715/2012.1819

57. Majid AN, Rohaeti E. The Effect of Context-Based Chemistry Learning on Student Achievement and Attitude. American Journal of Educational Research. 2018 Jun 8;6(6):836. https://doi.org/10.12691/education-6-6-37

58. Sarintohe E, Larsen JK, Burk WJ, Vink JM. The Prevalence of Overweight Status among Early Adolescents from Private Schools in Indonesia: Sex-Specific Patterns Determined by School Urbanization Level. Nutrients. 2022 Feb 27;14(5):1001. https://doi.org/10.3390/nu14051001

59. Abdullahi BB. Exploring Polytechnic Students' Awareness of Safety Equipment and Precautions for Sustainable Working Environment in School Workshops. International Journal of Science Technology and Society. 2017 Jan 1;5(6):210. https://doi.org/10.11648/j.ijsts.20170506.16

60. Kernan WD, Wheat ME, Lerner BA. Linking Learning and Health: A Pilot Study of Medical Students' Perceptions of the Academic Impact of Various Health Issues. Academic Psychiatry. 2008 Feb 1;32(1):61. https://doi.org/10.1176/appi.ap.32.1.61

61. Sylvester C. Analyzing the Elements and Ramifications of Substance Abuse among Secondary School Students: A Case of Six Selected Secondary Schools in Chibombo District of Central Province, Zambia. International Journal of Scientific Research and Management (IJSRM). 2024 Jan 27;12(1):3153. https://doi.org/10.18535/ijsrm/v12i01.el04

62. Shanks JD, Izumi BT, Sun CJ, Martin A, Shanks CB. Teaching Undergraduate Students to Visualize and Communicate Public Health Data with Infographics. Frontiers in Public Health. 2017 Nov 24;5. https://doi.org/10.3389/fpubh.2017.00315

63. Carroll FI, Lewin AH, Mascarella SW, Seltzman HH, Reddy PA. Designer drugs: a medicinal chemistry perspective (II). Annals of the New York Academy of Sciences. Wiley; 2020 May 12;1489(1):48. https://doi.org/10.1111/nyas.14349

64. Marchei E, Alías-Ferri M, Torrens M, Farré M, Pacifici R, Pichini S, et al. Ultra-High Performance Liquid Chromatography-High Resolution Mass Spectrometry and High-Sensitivity Gas Chromatography-Mass Spectrometry Screening of Classic Drugs and New Psychoactive Substances and Metabolites in Urine of Consumers. International Journal of Molecular Sciences. 2021 Apr 13;22(8):4000. https://doi.org/10.3390/ijms22084000

65. Dick RN, McCauley HL, Jones KA, Tancredi DJ, Goldstein S, Blackburn S, et al. Cyber dating abuse among teens using school-based health centers. Pediatrics. 2014;134.

66. Abu-Siniyeh A, Al-Shehri SS. Safety in Medical Laboratories: Perception and Practice of University Students and Laboratory Workers. Applied Biosafety. 2020 Nov 5;26. https://doi.org/10.1089/apb.20.0050

67. Singh R, Saini N. Role of Social Media in Promoting Tourism, Hospitality and Entrepreneurship, A Study of Amritsar City. Deleted Journal. 2024 Jun 25 2(6):2069. https://doi.org/10.47392/irjaem.2024.0304

68. Lüdecke D, Knesebeck O von dem, Kofahl C. Public knowledge about dementia in Germany—results of a population survey. International Journal of Public Health. 2015 Jul 6;61(1):9. https://doi.org/10.1007/s00038-015-0703-x

69. Saldaña ÁB, Sanhueza JR, Manríquez-Hizaut M, Rojas VC, Huepe G, Aliaga-Castillo V. Community-Based Rehabilitation (CBR) in primary care centers in Chile. Revista de Saúde Pública. 2020 Apr 24;54:38. https://doi.org/10.11606/s1518-8787.2020054001999

70. Smith TJ. Multicultural ethics in rehabilitation services. Journal of Vocational Rehabilitation. 2021;54:295.

71. Dubreucq J. Quels outils thérapeutiques en faveur du rétablissement dans la schizophrénie ? Annales Médico-psychologiques revue psychiatrique. 2021 Mar 3;179(4):363. https://doi.org/10.1016/j.amp.2021.02.017

72. Reniers R, Murphy LE, Lin A, Bartolomé SP, Wood SJ. Risk Perception and Risk-Taking Behaviour during Adolescence: The Influence of Personality and Gender. PLoS ONE. 2016 Apr 21;11(4). https://doi.org/10.1371/journal.pone.0153842

73. Ullrich R, Becker M, Scharf J. The Development of Gender Role Attitudes During Adolescence: Effects of Sex, Socioeconomic Background, and Cognitive Abilities. Journal of Youth and Adolescence. 2022 Jul 15;51(11):2114. https://doi.org/10.1007/s10964-022-01651-z

74. Andreoni J, Girolamo AD, List JA, Mackevicius C, Samek A. Risk preferences of children and adolescents in relation to gender, cognitive skills, soft skills, and executive functions. Journal of Economic Behavior & Organization. 2019 Jul 20;179:729. https://doi.org/10.1016/j.jebo.2019.05.002

75. Nobelius AM, Kalina B, Pool R, Whitworth J, Chesters J, Power R. Sexual and reproductive health information sources preferred by out-of-school adolescents in rural southwest Uganda. Sex Education. 2010 Feb 1;10(1):91. https://doi.org/10.1080/14681810903491438

76. Iswadi U. THE ROLE OF FAMILY IN IMPROVING THE QUALITY OF HUMAN RESOURCES. Investama Jurnal Ekonomi dan Bisnis. 2023 Jun 1;8(2):121. https://doi.org/10.56997/investamajurnalekonomidanbisnis.v8i2.963

77. Sari CAM, Utari P, Satyawan IA. Identification of communication strategies for population control in indonesia: A systematic review. KnE Social Sciences. 2022; https://api.semanticscholar.org/CorpusId:247491680

78. Bradley J. Defining and overcoming barriers between euro-american chaplains and african american families. Journal of Pastoral Care and Counseling. 2009;63:1.

79. Kobak R, Abbott CH, Zisk A, Bounoua N. Adapting to the changing needs of adolescents: parenting practices and challenges to sensitive attunement. Current Opinion in Psychology. Elsevier BV; 2017 Mar 18;15:137. https://doi.org/10.1016/j.copsyc.2017.02.018

80. Rizkiansyah M, Ariestyani A, Yunus U. The comparison between cyber extension and traditional interaction in the farmers environment during pandemic. In: IOP Conference Series: Earth and Environmental Science. IOP Publishing Ltd; 2022. p. 12058.

81. Sánchez D, Viejo A, Batet M. Automatic Assessment of Privacy Policies under the GDPR. Applied Sciences. 2021 Feb 17;11(4):1762. https://doi.org/10.3390/app11041762

82. Coelho J, Pécune F, Micoulaud-Franchi JA, Bioulac B, Philip P. Promoting mental health in the age of new digital tools: balancing challenges and opportunities of social media, chatbots, and wearables. Frontiers in Digital Health. 2025;7.

83. Budiman LS, Listyaningsih U, Putri RF, White B. The influence of adolescent characteristics toward the knowledge about generation planning in sub-village of family planning. E3S Web of Conferences. 2020;1005. https://api.semanticscholar.org/CorpusId:226471810

84. Sanches E, Ramos CMQ. Evaluating the Impact of Instagram Engagement Metrics on Corporate Revenue Growth: Introducing the Loyalty Rate. Information. 2025 Apr 2;16(4):287. https://doi.org/10.3390/info16040287

85. Yoder JD, Snell AF, Tobias A. Balancing multicultural competence with social justice: Feminist beliefs and optimal psychological functioning. The Counseling Psychologist. 2012;40:1101.

86. Badmus OT, Jita LC. Investigation of factors influencing career choice among STEM undergraduates in Nigeria universities. Eurasia Journal of Mathematics Science and Technology Education. 2023 Jan 14;19(1). https://doi.org/10.29333/ejmste/12838

87. Pérez A, Osman A, Peña L, Abad-Vivero EN, Hardin JW, Sargent JD, et al. Parent Education and Substance Use among Latin American Early Adolescents. Health Behavior and Policy Review. 2018 May 1;5(3):91. https://doi.org/10.14485/hbpr.5.3.9

88. Anthonia UE, Ibhafidon A. Students' Perception of Acquisition of Personal Health Skills among Adolescent in Imo State through the School Health Programme. Academic Journal of Interdisciplinary Studies. 2014 Nov 1; https://doi.org/10.5901/ajis.2014.v3n7p153

89. McGrew S, Breakstone J. Civic Online Reasoning Across the Curriculum: Developing and Testing the Efficacy of Digital Literacy Lessons. AERA Open. 2023 Jan 1;9. https://doi.org/10.1177/23328584231176451

90. Medley A, Kennedy CE, O'Reilly K, Sweat M. Effectiveness of Peer Education Interventions for HIV Prevention in Developing Countries: A Systematic Review and Meta-Analysis. AIDS Education and Prevention. Guilford Press; 2009 Jun 1;21(3):181. https://doi.org/10.1521/aeap.2009.21.3.181

91. Schaps EM, Churgin S, Palley CS, Takata B, Cohen AY. Primary Prevention Research: A Preliminary Review of Program Outcome Studies. International Journal of the Addictions. Marcel Dekker; 1980 Jan 1;15(5):657. https://doi.org/10.3109/10826088009040046

92. Raub LA, Shukor NA, Arshad MY, Rosli MS. An Integrated Model to Implement Contextual Learning with Virtual Learning Environment for Promoting Higher Order Thinking Skills in Malaysian Secondary Schools. International Education Studies. 2015 Jun 28;8(13). https://doi.org/10.5539/ies.v8n13p41

93. Gordillo A, Barra E, López-Pernas S, Quemada J. Development of Teacher Digital Competence in the Area of E-Safety through Educational Video Games. Sustainability. 2021 Jul 29;13(15):8485. https://doi.org/10.3390/su13158485

94. Mathews TL, Vatland C, Lugo AM, Koenig E, Gilroy SP. Training Peer Models to Promote Social Skills: Considerations for Practice. Focus on Autism and Other Developmental Disabilities. 2017 Oct 7;33(3):160. https://doi.org/10.1177/1088357617735814

95. Stella M. A study to assess the effectiveness of video teaching programmme on knowledge and attitude of substance abuse among adolescent boys in a selected school at Coimbatore. International Journal of Advance Research in Nursing. 2020 Jul 1;3(2):110. https://doi.org/10.33545/nursing.2020.v3.i2.b.108

96. Rahman AA, Ibrahim MI, Zin FM, Rahman RA, Idris NS, Zakaria R, et al. Adolescent to Adolescent Transformation Program- Nurturing, Enhancing and Promoting Adolescents' Healthy Habit (ATAP-NEPAH): Curbing Social Problems Among Adolescents in Kelantan Through Peer-To-Peer Health Education. Malaysian Journal of Social Sciences and Humanities (MJSSH). 2021 Mar 8;6(3):313. https://doi.org/10.47405/mjssh.v6i3.719

97. Digital media: Promoting healthy screen use in school-aged children and adolescents. Paediatrics & Child Health. Oxford University Press; 2019 Sep 1;24(6):402. https://doi.org/10.1093/pch/pxz095

98. Wang M, Mannan H, Poston D, Turnbull AP, Summers JA. Parents' Perceptions of Advocacy Activities and Their Impact on Family Quality of Life. Research and Practice for Persons with Severe Disabilities. 2004 Jun 1;29(2):144. https://doi.org/10.2511/rpsd.29.2.144

99. Silvhiany S, Huzaifah S, İsmet İ. Critical Digital Literacy: EFL Students' Ability to Evaluate Online Sources. Indonesian Journal of EFL and Linguistics. 2021 May 5;6(1):249. https://doi.org/10.21462/ijefl.v6i1.364

100. Shahbazi M, Bunker D. Social media trust: Fighting misinformation in the time of crisis. International Journal of Information Management. 2024 Mar 20;77:102780. https://doi.org/10.1016/j.ijinfomgt.2024.102780

101. Wineburg S, McGrew S. Lateral Reading and the Nature of Expertise: Reading Less and Learning More When Evaluating Digital Information. Teachers College Record The Voice of Scholarship in Education. 2019 Nov 1;121(11):1. https://doi.org/10.1177/016146811912101102

102. Evelia H, Ndayala PD, Page A, Wafula C, Westeneng J, Kuya J, et al. Aspirations versus Reality: Exploring Factors Affecting Meaningful Youth Participation in Sexual and Reproductive Health and Rights Programme in Rural Kenya. East African Journal of Health and Science. 2021 Mar 15;3(1):31. https://doi.org/10.37284/eajhs.3.1.297

103. Baird S, Hamory J, Gezahegne K, Pincock K, Woldehanna T, Yadete W, et al. Improving Menstrual Health Literacy Through Life-Skills Programming in Rural Ethiopia. Frontiers in Global Women s Health. 2022 Jul 8;3. https://doi.org/10.3389/fgwh.2022.838961

FINANCING

This research did not receive funding from other parties.

CONFLICT OF INTEREST

This research has no potential conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Irpan, Subagyo, Muhammad Hamid Anwar.
Data curation: Irpan.
Formal analysis: Irpan, Subagyo.
Research: Irpan.
Methodology: Irpan, Subagyo, Muhammad Hamid Anwar.
Project management: Subagyo, Muhammad Hamid Anwar.
Resources: Sandey Tantra Paramitha, Eko Purnomo.
Software: Irpan.
Supervision: Subagyo, Muhammad Hamid Anwar.
Validation: Subagyo, Muhammad Hamid Anwar.
Display: Irpan, Sandey Tantra Paramitha.
Drafting - original draft: Eko Purnomo.
Writing - proofreading and editing: Sandey Tantra Paramitha, Eko Purnomo.