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Analysis of the Relationship Between Knowledge Level and Whitening Cosmetic Selection Behavior Among University Students in Banyumas

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ABSTRACT

Background: The increasing use of skin-lightening cosmetics has made product safety and informed selection important concerns among university students. Adequate knowledge is essential to help students recognize cosmetic ingredients, understand potential risks, and make responsible purchasing decisions.Objective: This study aimed to assess students' knowledge and behavior in selecting skin-lightening cosmetics, examine the relationship between knowledge and selection behavior, and determine the association of educational type and level with cosmetic selection behavior among university students in Banyumas Regency.Methods: A descriptive-analytical study with a cross-sectional design was conducted in January 2025. Data were collected through an online questionnaire using Google Forms from 400 university students recruited through random sampling. Data were analyzed using Jamovi, with statistical tests applied to examine the relationships between knowledge, cosmetic selection behavior, and educational characteristics.Results:The findings showed that 71% of respondents had a high level of knowledge, while 91% demonstrated good behavior in selecting skin-lightening cosmetics. Knowledge was strongly and positively associated with selection behavior ($p < 0.01$; Spearman's rho = 0.640). However, educational type and educational level were not significantly associated with cosmetic selection behavior ($p > 0.05$ and $p = 0.701$, respectively). Conclusion:Most students demonstrated good knowledge and behavior in selecting skin-lightening cosmetics. Higher knowledge levels were significantly associated with better selection behavior, whereas educational type and level showed no significant association. These findings highlight the importance of strengthening knowledge and awareness of cosmetic safety to encourage informed and responsible product selection among university students.

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INTRODUCTION

Skin care has become a common practice among both women and men to maintain skin hygiene and appearance. The use of skin-lightening products often begins at a relatively young age, with the average age of initial use reported to be 16 years (Fadhila et al., 2020). This growing interest in skin care has developed alongside the expansion of Indonesia's cosmetics industry. In 2023, the number of cosmetics companies in Indonesia reportedly increased by 21.9% (Prayogi D. Z., 2024). This growth reflects increasing consumer demand for beauty products, including skin-lightening cosmetics.

Despite the growing popularity of cosmetic products, concerns regarding their safety remain important. Products marketed with promises of rapid skin-lightening effects may contain hazardous substances, particularly hydroquinone and mercury. Improper use of hydroquinone has been associated with skin tissue damage (Shifa et al., 2022), while mercury exposure may cause adverse effects on the skin, kidneys, nervous system, and other bodily functions (Aprinawati et al., 2023). These potential health risks highlight the importance of consumers' ability to understand product ingredients, benefits, and possible side effects before making purchasing decisions (Utoyo, 2022).

Knowledge plays an important role in shaping consumer understanding and decision-making. It encompasses the information and understanding individuals acquire about a particular subject (Khanam, 2016). In the context of cosmetic use, knowledge of product registration, ingredients, and potential adverse effects may influence how consumers select skin-lightening products (Fitriani, 2021). Previous research among female university students at a higher education institution in Banyumas reported a good level of knowledge regarding skin-lightening cosmetics (Ilahi et al., 2023). However, knowledge alone does not necessarily reflect actual consumer behavior, as individuals may have different considerations when selecting and using cosmetic products.

Although previous studies have examined knowledge regarding skin-lightening cosmetics, further investigation is needed to understand how knowledge relates to product-selection behavior across different educational backgrounds. In particular, comparisons between students from health-related and non-health-related academic programs remain important, considering their potentially different exposure to health information and knowledge of hazardous cosmetic ingredients. This issue is relevant in Banyumas Regency, where universities offer diverse academic disciplines and students have access to various cosmetic products and beauty services. Therefore, this study aimed to analyze the relationship between knowledge and skin-lightening cosmetic selection behavior among university students in Banyumas Regency, while also examining differences in these variables according to students' educational backgrounds. By considering both knowledge and educational background, this study is expected to provide a broader

understanding of factors associated with safer cosmetic selection among young adult consumers.

METHOD

This observational study employed a cross-sectional design with a descriptive-analytical approach. Data were collected in January 2025 through an online questionnaire administered using Google Forms. The study population consisted of 87,950 university students in Banyumas during the 2023/2024 academic year. A total of 400 respondents were recruited using proportional cluster random sampling across universities, with the sample size determined using Slovin's formula. The research instrument was adapted from Ilahi et al. (2023) and consisted of 12 knowledge items and 11 behavioral items. Data were analyzed using Jamovi software. Pearson's correlation test was applied to data meeting parametric assumptions, while Spearman's rank correlation test was used for non-normally distributed data. Statistical significance was set at $p < 0.05$.

RESULT AND DISCUSSION

Table 1. Respondents' Knowledge of Skin-Lightening Cosmetics

No	Questionnaire Statements	Respondent			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1	Cosmetics are used to enhance personal appearance.	251	112	20	17
2	Cosmetics are classified into skin-care cosmetics and decorative cosmetics.	196	163	33	8
3	Skin-lightening products and moisturizers are classified as skin-care cosmetics.	175	155	58	12
4	Skin-lightening cosmetics work by reducing or inhibiting melanin production.	123	179	82	16
5	Glutathione is an ingredient used in skin-lightening cosmetics.	149	171	69	11
6	Alpha Hydroxy Acids (AHA) are not classified as skin-lightening compounds used in skin-lightening cosmetics.	44	99	152	105
7	The combination of vitamins C and E works synergistically to enhance skin-lightening effects.	168	179	43	10
8	Examples of skin-lightening products include serums, toners, creams, and facial masks.	177	162	48	13
9	Hydroquinone is permitted for use in skin-care cosmetic products.	30	79	136	155
10	The concentration of hydroquinone	144	167	63	26

	should not exceed 0.02%.				
11	Mercury exposure can cause fetal damage.	255	103	28	14
12	Mercury can cause cancer, kidney damage, and skin irritation.	270	91	25	14

Figure 1. Percentage Distribution of Students' Knowledge Levels Regarding Skin-Lightening Cosmetics

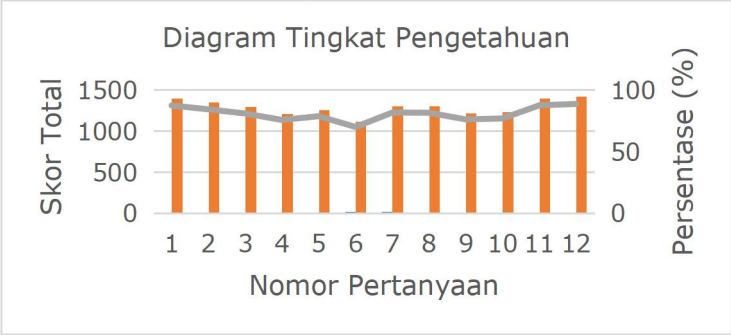


Figure 2. Overall Distribution of Students' Knowledge Levels

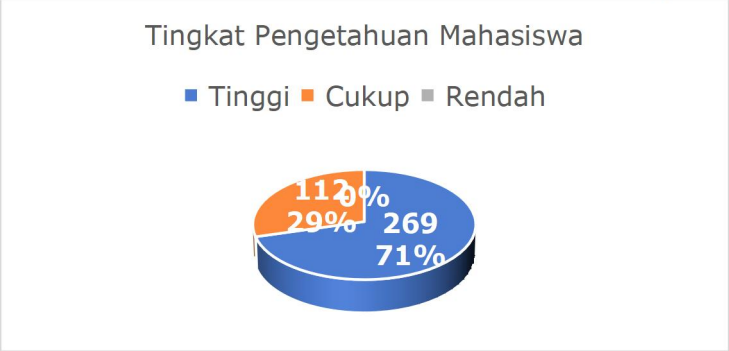


Table 2. Results of the Questionnaire on Students' Behavior in Selecting Skin-Lightening Cosmetics

No	Questionnaire Statements	Respondent			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1	If a skin-whitening cosmetic product can provide quick results, I would be immediately interested in purchasing it without feeling the need to seek information about its ingredients and legal authorization.	31	58	102	209
2	I recognize my skin condition before choosing an appropriate skin-whitening cosmetic product.	245	118	30	7
3	I tend to switch skin-whitening cosmetic products without considering their potential side effects.	34	45	99	222

4	I prefer skin-whitening cosmetic products that have official safety certification and legal authorization.	277	87	23	13
5	I am aware that some skin-whitening cosmetic products may have harmful side effects, but I still consider purchasing them if they promise promising results.	50	84	114	152
6	I avoid counterfeit skin-whitening cosmetic products or those without official marketing authorization.	300	64	24	12
7	I ensure that the skin-whitening cosmetics I use are free from harmful ingredients, even if they do not promise quick whitening results.	256	98	33	13
8	I tend to purchase skin-whitening products that claim to deliver fast results.	180	129	65	26
9	I often look for user testimonials before deciding to purchase skin-whitening cosmetic products.	269	84	35	12
10	I will stop using a skin-whitening product if I experience an allergic reaction or skin irritation.	300	69	22	9
11	I believe that using skin-whitening cosmetics can help me achieve a better appearance.	149	148	77	26

Figure 3. Percentage of Students' Behavior in Selecting Skin-Whitening Cosmetics

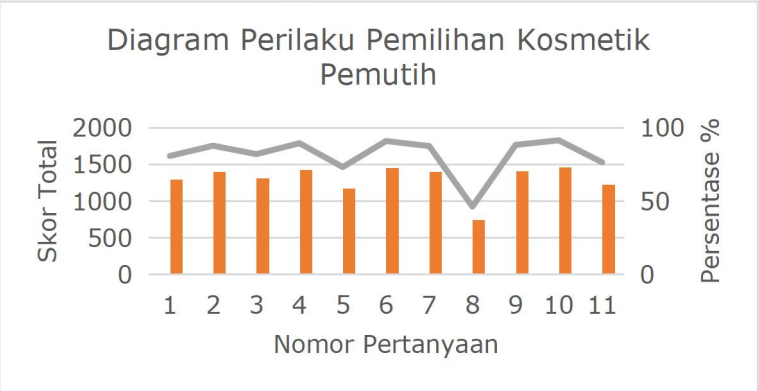


Figure 4. Overall Distribution of Students' Behavior in Selecting Skin-Whitening Cosmetics

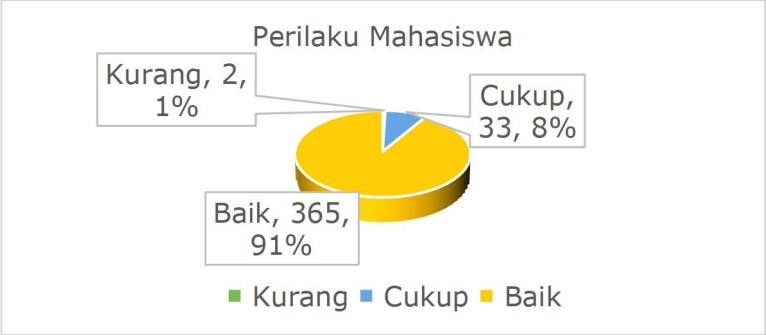


Table 3. Normality Test Results

	Kolmogorov-Smirnov[a]		
	Statistic	*df*	*Sig.*
Knowledge	0.097	400	<,001
Behaviour	0.116	400	<,001

Table 4. Analysis of the Relationship Between Knowledge Level and Behavior in Selecting Skin-Whitening Cosmetics

		Behavior in Selecting Skin-Whitening Cosmetics			**Spearman's Rho**	**df**	**p-value**
		Good	Moderate	Low			
Level of Knowledge	High	263	7	0	<.001	398	<.001
	Moderate	4	12	2	<.001	398	<.001
	Low	98	14	0	<.001	398	<.001

Table 5. Relationship Between Educational Characteristics and Behavior in Selecting Skin-Whitening Cosmetics

	P value	Kinds of Education	Level of Education
Behaviour	0,05		0,536
Behaviour	0,05	0,701	

1. Students' Knowledge Level Regarding Skin-Lightening Cosmetics in Banyumas

The findings showed that the majority of students (71%) had a high level of knowledge regarding skin-lightening cosmetics. Based on the 12 questionnaire items completed by 400 respondents, most knowledge indicators were classified into the high category (76–100%). However, two indicators, namely the mechanism of action of skin-lightening ingredients and the role of alpha-hydroxy acids (AHA), were classified into the moderate category (56–75%). This finding indicates that although students generally had good knowledge of skin-lightening cosmetics, their understanding of certain scientific aspects of cosmetic ingredients still requires improvement.

This finding is consistent with Ilahi et al. (2023), who reported that female university students in Banyumas had good knowledge regarding skin-lightening cosmetics. Knowledge of cosmetic

ingredients and their potential effects is important because it enables consumers to understand product benefits, identify potentially harmful substances, and make informed decisions before purchasing cosmetic products.

2. Students' Behavior in Selecting Skin-Lightening Cosmetics in Banyumas

The results indicated that 365 respondents (91%) demonstrated good behavior in selecting skin-lightening cosmetics. Most students considered product safety, recognized their skin condition before use, avoided counterfeit products or cosmetics without official marketing authorization, and discontinued product use when adverse reactions occurred. These findings suggest that students generally demonstrated awareness of the importance of selecting safe cosmetic products.

This result is consistent with Fitriani (2021), who explained that better knowledge of cosmetic safety can contribute to safer cosmetic-use behavior. Similarly, Zubaidah (2022) emphasized the importance of seeking information and considering user testimonials before purchasing cosmetic products, while Zainal (2024) highlighted the importance of discontinuing product use when adverse reactions occur.

Nevertheless, some students still demonstrated a tendency to purchase products based on claims of rapid whitening results. This suggests that good overall behavior does not necessarily eliminate risky purchasing tendencies. Promotional claims and expectations regarding physical appearance may influence cosmetic-selection decisions. Therefore, students need to improve their ability to critically evaluate product claims and prioritize safety over promises of immediate results (Pakaila, 2024).

3. Relationship Between Knowledge Level And Behavior In Selecting Skin-Lightening Cosmetics Among University Students In Banyumas

The statistical analysis demonstrated a significant relationship between students' knowledge level and their behavior in selecting skin-lightening cosmetics. The Kolmogorov–Smirnov normality test indicated that the data were not normally distributed ($p < 0.05$). Therefore, the Spearman's Rank Correlation test was used. The results showed a statistically significant relationship ($p < 0.01$), with a Spearman's rho coefficient of 0.640, indicating a strong positive relationship between the two variables.

This finding suggests that students with higher levels of knowledge tended to demonstrate better behavior in selecting skin-lightening cosmetic products. Knowledge may help students recognize potentially harmful ingredients, understand product safety

requirements, and evaluate cosmetic information before making purchasing decisions.

This result is consistent with Ilahi et al. (2023), who reported a significant relationship between knowledge and behavior in selecting skin-whitening cosmetics among university students. These findings emphasize the importance of improving students' knowledge through appropriate educational interventions to encourage safer and more responsible cosmetic-selection practices.

4. *Relationship Between Educational Type And Educational Level And Behavior In Selecting Skin-Lightening Cosmetics Among University Students In Banyumas*

The findings also showed that educational characteristics were not significantly associated with students' behavior in selecting skin-lightening cosmetics. Based on the statistical analysis, educational type did not show a significant difference in behavior ($p > 0.05$). Similarly, educational level was not significantly associated with behavior ($p = 0.701$). These results indicate that students' behavior in selecting skin-lightening cosmetics was not necessarily determined by whether they studied in health-related or non-health-related fields or by their educational attainment.

Although students in health-related fields may have greater academic exposure to skin anatomy, cosmetic ingredients, and potential health risks, information about cosmetics is also widely available through social media and other information sources. Pratiwi (2020) explained that social media facilitates information dissemination, communication, interaction, and the exchange of ideas. Furthermore, peer influence and social environments may contribute to individual behavior and decision-making (Lakshmi, 2019).

These findings differ from Ariga (2022), who reported a significant relationship between educational level and behavior. However, the results of the present study suggest that formal education alone may not fully explain students' behavior in selecting cosmetic products. Other factors, including individual knowledge, access to reliable information, social interaction, and awareness of product safety, may also contribute to cosmetic-selection behavior (Khasanah et al., 2025).

Finally, the findings indicate that knowledge level had a significant relationship with students' behavior in selecting skin-lightening cosmetics, whereas educational type and educational level did not show statistically significant associations. Therefore, improving practical knowledge and awareness of cosmetic safety should be an important consideration in promoting responsible cosmetic-selection behavior among university students.

CONCLUSION

This study concluded that the majority of university students in Banyumas had a high level of knowledge (71%) and demonstrated good behavior (91%) in selecting skin-lightening cosmetics. A significant positive relationship was found between knowledge level and behavior (Spearman's rho = 0.640; $p < 0.01$). However, educational type and educational level were not significantly associated with students' behavior. These findings highlight the importance of improving knowledge and awareness of cosmetic safety to encourage informed and responsible cosmetic-selection practices among university students.

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