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The Relationship Between Adolescent Knowledge Level and Potential Side Effects of Using Non-BPOM Skincare Packages Sold on Social Media

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ABSTRACT

Purpose: This study aims to describe respondent characteristics and examine the relationship between adolescents' knowledge levels and the potential side effects of using non-BPOM skincare packages purchased through social media.

Research Method: A quantitative observational-analytical study with a cross-sectional design was conducted among 100 adolescent girls aged 13–18 years in Demak Regency, Central Java. Respondents were selected through purposive sampling. Data were collected using validated and reliable structured questionnaires measuring knowledge and potential skincare side effects. Univariate analysis and Fisher's Exact Test at a 5% significance level were performed using IBM SPSS Statistics.

Results and Discussion: Most respondents had good knowledge (91%), while 56% experienced moderate side effects and 43% experienced mild side effects. Fisher's Exact Test produced a p-value of 1.000, indicating no significant relationship between knowledge level and potential side effects. Product ingredients, skin sensitivity, usage frequency, and product suitability may better explain the reported reactions.

Implications: Health professionals, schools, and regulators should strengthen education emphasizing behavioral change, BPOM registration verification, and safe product selection. Future studies should examine product composition, usage behavior, and skin characteristics.

Originality: This study specifically investigates knowledge and side effects among adolescents using non-BPOM skincare packages obtained through social media.

Keywords: adolescent knowledge; skincare side effects; non-BPOM cosmetics; social media; product safety; adolescent girls

1. Introduction

Skincare is a group of cosmetic products used to protect and nourish the skin, including products that contain biologically active ingredients whose benefits nourish the skin's surface, as well as those that require a prescription for use. Skincare or a series of facial treatments can be in the form of creams, soaps, toners, or lotions (Pratiwi et al., 2023). Creams are semi-solid cosmetic preparations composed of one or more basic ingredients, both natural and synthetic, and formulated to produce certain functions on the skin. Components can include active substances such as sunscreen, dyes, and preservatives. Creams are often developed as a widely circulated whitening product on the market,

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mainly due to their practical use, affordable price, and claims of quick results (Charismawati et al., 2021). Soap can be defined as a cleaning agent formed through the reaction between bases and fats or oils and is used to remove dirt, bacteria, and impurities from the skin. Soap is also formulated to help maintain moisture, softness, and healthy skin. This product is available in various forms of preparations such as solid, liquid, and gel soaps according to the user's needs and preferences (Yansen, 2022). Toner is a skincare liquid formulated to remove remaining dirt or makeup, moisturize the skin, and help reduce excess oil without causing dryness on sensitive skin. Toner is usually used after cleansing and before moisturizing to maximize skin hygiene. This product also functions to maintain the pH balance of the skin (Aspadiah et al., 2024). Lotion is an emollient-type cosmetic preparation that has a higher water content than other forms of moisturizer. This preparation is formulated to retain skin moisture, help cleanse, and carry active ingredients to work effectively on skin surfaces. The high water content makes the lotion easy to spread, does not leave an oily taste, provides a cool sensation, has good dispersibility and penetration, and is easy to clean with water. This product is commonly used for its ability to keep the skin moisturized (Aspadiah et al., 2024).

Drug Side Effects (ESOs) are dangerous side effects that are unwanted and occur accidentally, appearing after a drug is administered in normal doses for disease therapy in humans (Bone, 2023). Non-BPOM packaged skincare has the potential to cause side effects because its composition and formulation process have not undergone adequate safety evaluation, which is important for controlling topical formulations (Ramadani et al., 2025). Unwanted reactions due to the use of skincare are included in the category of cosmetic side effects because they occur after the use of the product at a reasonable dosage or way of use. Dermatological research shows that there are complaints such as redness, itching, and skin irritation in skincare users (Lestari et al., 2022).

Cosmetic side effects are not just mild reactions such as redness or itching, but can develop into more serious skin complaints. Skincare products without a distribution permit, which are included in the non-BPOM category, are often found to contain harmful ingredients that do not meet cosmetic safety regulations. Harmful ingredients such as mercury, hydroquinone, retinoic acid, and corticosteroids in illegal bleaching products can cause adverse reactions ranging from irritation and peeling skin to pigmentation damage. Chronic mercury exposure can even potentially cause nervous and kidney system disorders. The inconsistency in the composition of the active ingredients shows that the use of non-BPOM cosmetic products poses a much greater risk because it does not go through the safety, quality, and benefit assessment process as required in drug and food regulations (Purwanto, 2024).

Knowledge is the result of a person's process of understanding an object through the five senses, such as eyes, ears, nose, and others. This process is influenced by a person's level of attention to the object. Usually, human knowledge is obtained through the senses of sight and hearing (Ade Irawan, Sarniyati, 2022). Cognitive knowledge is part of the formation of a person's behavior. Behaviors based on knowledge tend to last longer than behaviors that are not based on knowledge. Providing education can significantly increase respondents' knowledge in the use of a product; many studies confirm that the level of knowledge affects the way individuals understand product safety information and the potential risks that can be posed by improper use of products (Apriliasari et al., 2025)

The remainder of this paper is organized as follows. Section 2 provides a literature review and hypothesis development. Section 3 presents the research method and design. Section 4 provides the results and discussion. Section 5 presents Concluding Remarks and Recommendations.

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2. Research Method

This study is a quantitative research with an observational analytical approach and uses a cross-sectional design. The study was conducted without giving special treatment to the respondents, but only observed and analyzed data obtained through questionnaires to determine the relationship between adolescents' level of knowledge and potential side effects of using non-BPOM skincare packages obtained through social media. The research was carried out in Demak Regency, Central Java, with the consideration that the area has the potential for the phenomenon of using non-BPOM packaged skincare among adolescents, so it is relevant to be researched. The population in this study is adolescent girls aged 10–19 years living in Gajah District, Demak Regency, with a population of 91,700 people. The sample determination was carried out using purposive sampling techniques based on certain criteria, namely young women aged 10- 19 years, residing in Demak Regency, having or currently using non-BPOM skincare packages purchased through social media, and willing to be respondents by signing an informed consent sheet. Respondents who did not complete the questionnaire completely or did not meet the inclusion criteria were excluded from the study. The sample size was calculated using the Slovin formula with an error rate of 10%, so that a minimum sample number of 100 respondents was obtained. To anticipate the possibility of a 20% dropout, the number of samples recruited was 125 respondents.

Data collection was carried out directly in several schools where the research was located using instruments in the form of structured questionnaires. The questionnaire consisted of three parts, namely the identity of the respondents, the level of knowledge about non-BPOM packaged skincare, and the potential side effects experienced after using the product. The knowledge level variable was measured using 10 questions with a choice of correct and incorrect answers, with a score of 1 for correct answers and 0 for incorrect answers, then categorized as good (76–100%), fair (56–75%), and poor (≤55%). Potential side effect variables were measured using 7 question items with a severity scale, namely 0 (none), 1 (mild), 2 (moderate), and 3 (severe), then categorized into mild (0–7), moderate (8–14), and severe (15–21). The filling of the side effects section is only done by respondents who stated that they have used or are using non-BPOM skincare packages to minimize information bias.

Before being used, the questionnaire was tested for validity and reliability on 30 respondents. The validity test was carried out using the Pearson Product Moment correlation, with valid criteria if the calculated r value is greater than the r of the table at a significance level of 5% ($\alpha = 0.05$). The reliability test was carried out using Cronbach's alpha with the reliability criterion if the alpha value is greater than 0.60. Validity and reliability testing were conducted using the IBM SPSS Statistics program version 27.0.

Univariate analysis was used to describe the frequency distribution of each variable, namely adolescent knowledge level and potential side effects of using non-BPOM packaged skincare. Bivariate analysis was performed to determine the relationship between the two variables using the Chi-Square test. If the requirements of the Chi-Square test are not met, then an alternative Fisher's Exact test is used. All tests were conducted at a confidence level of 95% with a significance level (α) of 0.05. A p-value of ≤ 0.05 indicates a significant relationship between adolescents' level of knowledge and potential side effects of using non-BPOM skincare packages. This research has obtained ethical approval from the Health Research Ethics Commission (KEPK) of the University of Muhammadiyah Purwokerto with registration number KEPK/UMP/217/XII/2025. The research was carried out in accordance with

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research ethics principles, including obtaining respondents' informed consent, maintaining the confidentiality of respondents' identities, and using data only for research purposes.

3. Results and Discussion

3.1 Analysis Results

3.1.1 *Respondent Characteristics*

The results of the analysis of respondent characteristics showed that the majority of respondents were 16–18 years old, all respondents were female, and most of them had a high school education. The most common usage pattern is non-BPOM skincare for 1- 3 months; the most widely used type of non-BPOM skincare is skincare in package form compared to retail use.

Table 1. Distribution of Respondent Characteristics

Parameters		Frequency (n)	Present (%)
Age	13-15 Years	45	45%
	16-18 Years	55	55%
Gender	Male	0	0%
	Women	100	100%
Final Education	Junior High School	45	45%
	High School	55	55%
	College	0	0%
Length of Use	< 1 Month	28	28%
	1-3 Months	43	43%
	4-6 Months	20	20%
	> 6 Months	9	9%
Types of Skincare Used	Package	77	77%
	Retail	33	23%

3.1.2 *Category Analysis of Knowledge Level and Potential Side Effects*

Table 2. Distribution of Respondents' Knowledge Level

Categories	Frequency (n)	Present (%)
Good	91	91.0%
Enough	8	8.0%
Less	1	1.0%
Total	**100**	**100.0%**

The results of the univariate analysis in the knowledge level category show that most of the respondents had a level of knowledge in the good category, namely 91 respondents (91.0%). These results show that the majority of respondents already have a good level of knowledge related to the use of skincare.

Table 3. Distribution of Potential Side Effects of Respondents

Categories	Frequency (n)	Present (%)
Lightweight	43	43.0%
Medium	56	56.0%
Weight	1	1.0%

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Total	**100**	**100.0%**

The results of the univariate analysis in the potential side effect category showed that most respondents experienced potential side effects in the moderate category, namely 56 respondents (56.0%), followed by the mild category as many as 43 respondents (43.0%).

3.1.3 *Prerequisite Test*

The distribution of data in the category of moderate and mild adverse events showed a significance value (Sig) of < 0.05 in the Kolmogorov–Smirnov and Shapiro–Wilk tests, so it can be concluded that the data are not normally distributed.

Table 4. Normality Test Results

Categories Side Effects	Normality Test	Statistics	df	Sig
Medium	Kolmogorov-Smirnov	0.526	56	<0.001
	Shapiro-Wilk	0.326	56	<0.001
Lightweight	Kolmogorov-Smirnov	0.531	43	<0.001
	Shapiro-Wilk	0.331	43	<0.001

3.1.4 *Analysis of the Relationship between Knowledge Level and Potential Side Effects*

Table 5. The Relationship of Knowledge Level to Potential Side Effects (Fisher's Exact Test)

Knowledge Level	Weight Side Effects n (%)	Mild-moderate side effects n (%)	Total	p-value
High (Good)	1 (1.1)	90 (98.9)	91	1.000
Low (Moderate-Less)	0 (0.0)	9 (100.0)	9	
Total	1 (1.0)	99 (99.0)	100	

The results of the bivariate analysis using Fisher's Exact Test showed a value of p = 1.000 (p > 0.05), which means that there was no relationship between respondents' level of knowledge and the potential side effects of using non-BPOM skincare.

3.2 Discussion

3.2.1 *Respondent Characteristics*

3.2.1.1 *Age*

The results showed that respondents were in the age group of 16 – 18 years, namely 55 respondents or 55%, while respondents aged 13 – 15 years amounted to 45 respondents or 45%. This age range is included in the adolescent phase, where individuals begin to have a high interest in appearance and skin care. In this phase, teenagers tend to be more active in looking for and trying various skincare products, including products obtained from social media, without considering overall safety. Adolescents are also a vulnerable group to the influence of promotions on social media, so mentoring and supervision are needed so that adolescents can be more critical in responding to information and choosing safe products (Jayanti, 2022).

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3.2.1.2 *Gender*

All respondents in this study were female. This condition is caused by the inclusion criteria of the study, which specifically assign female respondents. The selection of these criteria is based on the high usage of skincare among adolescent girls, so this group is considered more relevant to describe the potential side effects of using skincare non-BPOM (Prince, 2024).

3.2.1.3 *Education*

Based on education level, most respondents (55 respondents or 55%) had a last education level of high school or were still in high school. In comparison, 45 respondents (45%) had a last education level of junior high school or were still in junior high school.

3.2.1.4 *Length of Use*

The majority of respondents use Skincare non-BPOM for 1-3 months, namely there are 43 respondents or 43%, followed by 28 or 28% of use of less than 1 month, the duration of use of 4-6 months amounting to 20 respondents or 20%, and those who use Skincare more than 6 months as many as 9 respondents or 9%. Judging from the relatively short duration of use, the majority of the use is relatively short; this shows that most respondents are still in the early stages of using the product, but side effects can still appear in a short time depending on the content of the active ingredients contained in the Skincare product (Lestari et al., 2022).

3.2.2 *Types of Skincare Used*

The most widely used type of Skincare by respondents is Skincare in the form of a package, with 77 respondents (77%), where each package Skincare contains several products. In comparison, respondents who use Skincare non-BPOM in the form of retail amounted to 33 respondents or 33%. However, the number was less than the use of Skincare in packages, but they still experience potential side effects. These findings show that the use of Skincare Non-BPOM, both in package and retail form, still has the risk of side effects due to the presence of harmful ingredients in the Skincare Non-BPOM (Hand ayani et al., 2025).

3.2.3 *Category Analysis of Knowledge Level and Potential Side Effects*

The results of the univariate analysis showed that most of the respondents had a level of knowledge in the good category. This high level of knowledge can be influenced by the ease of access to related information about skincare through social media, the internet, and respondents' personal experiences in using skincare products. Extensive access to information allows respondents to gain knowledge about the benefits, how to use, and potential risks of using skincare (Alamer et al., 2023). A univariate analysis of the side effect category showed that most respondents experienced moderate and mild side effects. This indicates that the use of Skincare Non-BPOM packages still has the potential to cause skin complaints, even though the majority of respondents have a good level of knowledge; however, they still have the potential to experience side effects, and most respondents do not experience side effects in the severe category. Side effects experienced are generally mild to moderate, such as reddish irritation or itching of the skin (Lestari et al., 2022). The presence of one respondent who experienced severe-category side effects showed that the use of Skincare non-BPOM still carries more serious risks, even

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though the number of incidents is relatively small. These findings reinforce the importance of caution in the use of skincare products that do not have an official distribution permit (Source: et al., 2025).

3.2.4 *Analysis Prerequisites Test*

The results of the normality test showed that the knowledge level score in the category of mild and moderate side effects had a significant p-value of < 0.05 (0.001). These results show that the knowledge level score data is not distributed normally. The severe side effect category shows that the knowledge level data is constant, so the system cannot perform the normality test. This condition shows that all respondents in the category have the same level of knowledge score, so there are no variations in data that can be analyzed statistically.

3.2.5 *Analysis of the Relationship between Knowledge Level and Potential Side Effects*

The results of bivariate analysis using Fisher's Exact test showed that there was no statistically significant relationship between the level of knowledge and the category of adverse effects of using non-BPOM skincare. The p-value of 1,000 was greater than 0.05, indicating that the respondents' level of knowledge is not significantly related to the variation in side effects experienced (Scott, 2023). These results show that respondents' level of knowledge is not the main determining factor for the occurrence of side effects when using non-BPOM skincare packages. Although respondents have a good level of knowledge and still have the potential to experience side effects, the side effects experienced are generally not included in the severe category. The absence of a meaningful association may be due to limited data variation, especially in the category of severe adverse events where there are very few in number. Uneven data distribution limits statistical testing and the detection of relationships. This condition also shows that side effects can occur in respondents with both a good and low level of knowledge (Scott, 2023). The fact that respondents with a good level of knowledge still experience side effects shows that knowledge alone is not always directly proportional to safe skincare usage behavior. Other factors such as the content of active ingredients, the suitability of the product for skin type, frequency of use, and individual skin sensitivity have the potential to play a role in the occurrence of side effects (Notoatmodjo, 2014).

The results of this study differ from the research of Mundriyastutik (2022), which found a relationship between the level of knowledge and attitude in the selection of facial moisturizing creams and the skin health of adolescent girls. This difference is because Mundriyastutik's research does not specifically assess the side effects of product use and does not focus on the use of non-BPOM packaged skincare. Research by Lestari et al. (2022) found an incidence of skin irritation due to the use of facial cream cosmetics, but the study did not assess the respondents' level of knowledge. This study expands the findings by including aspects of the level of knowledge and context of the use of non-BPOM skincare packages, thereby providing a more comprehensive picture of the risk factors for side effects in skincare users.

4. Concluding Remarks and Recommendation

The increasing use of skincare products promoted through social media has raised concerns regarding the safety of non-BPOM skincare packages, particularly among adolescents. This study examined whether adolescents' level of knowledge was associated with the potential side effects of using non-

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BPOM skincare packages. A quantitative observational-analytical approach with a cross-sectional design was applied to 100 adolescent girls in Demak Regency, Central Java, who were selected through purposive sampling. Data were collected using structured questionnaires and analyzed using univariate analysis and Fisher's Exact Test. The findings showed that most respondents had a good level of knowledge, while the majority experienced mild to moderate potential side effects. The statistical analysis indicated no significant relationship between adolescents' knowledge level and the potential side effects of using non-BPOM skincare packages. Therefore, knowledge alone may not be sufficient to protect adolescents from the risks associated with unsafe skincare products.

Theoretically, this study contributes to health behavior research by showing that a high level of knowledge does not necessarily correspond to a lower risk of skincare-related side effects. Other factors, including product composition, skin sensitivity, frequency and duration of use, product suitability, and actual skincare practices, may have a more direct influence on the occurrence of adverse reactions. Practically, the findings emphasize the need for health professionals, schools, parents, and communities to provide education that extends beyond increasing knowledge and encourages adolescents to verify BPOM registration, understand product labels, and adopt safer skincare practices. From a policy perspective, stronger monitoring of skincare products marketed through social media and more intensive public awareness campaigns are needed to reduce adolescents' exposure to illegal or potentially harmful cosmetics. The originality of this study lies in its specific examination of knowledge and potential side effects among adolescent users of non-BPOM skincare packages purchased through social media.

This study has several limitations. The cross-sectional design does not allow causal relationships to be established, and the purposive sampling method limits the generalizability of the findings beyond the study population. The respondents were limited to adolescent girls in one geographical area, and the side effects were assessed through self-reported questionnaires without clinical examination or laboratory analysis of the skincare products. In addition, the uneven distribution of respondents across knowledge and side-effect categories may have reduced the ability of the statistical test to identify meaningful relationships. Future studies should involve larger and more diverse samples, apply longitudinal or case-control designs, and include dermatological examinations and laboratory testing of product ingredients. Further research should also investigate behavioral factors, skin types, product composition, duration of use, social media influence, and parental supervision to provide a more comprehensive understanding of the risks associated with non-BPOM skincare use among adolescents.

Statement of Use of Generative AI

During the preparation of this work, the author used generative artificial intelligence tools to support the scientific writing process. Grammarly was used to check grammar, refine writing style, and improve clarity in scientific writing. All interpretations, analyses, and conclusions presented in this study are the sole responsibility of the author.

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