

Effectiveness of self-instructional module on knowledge regarding ill effects of cosmetic usage on health among adolescent girls

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Abstract

Cosmetic use has become increasingly common among adolescent girls due to the influence of social media, peer groups, and beauty-related trends. Although cosmetics are widely used for personal grooming and enhancing appearance, many products contain chemical ingredients that may cause adverse health effects such as skin allergies, irritation, acne, pigmentation changes, and other dermatological problems. Limited awareness regarding these potential hazards highlights the need for educational interventions. The present study aimed to evaluate the effectiveness of a Self-Instructional Module (SIM) on knowledge regarding the ill effects of cosmetic usage on health among adolescent girls. A quasi-experimental research design was adopted. The sample included 100 adolescent girls (50 in experimental group and 50 in control group), aged 17–19 years residing in a selected semi-urban community at Coimbatore, and selected using a non-probability convenience sampling technique. Data were collected using a structured knowledge questionnaire. The findings revealed that in experimental group, there was a significant improvement in the mean knowledge score from 7.96 ± 3.15 in the pre-test to 20.52 ± 1.89 in the post-test ($t=33.407$, $P<0.001$), whereas the control group showed no much change. A significant association was found between pre-test knowledge and selected demographic variables (personal cosmetic kit and use of branded cosmetics). The study concluded that the Self-Instructional Module was highly effective in improving knowledge regarding the ill effects of cosmetic usage on health among adolescent girls. The study emphasizes the importance of structured educational interventions in promoting cosmetic safety awareness and preventing cosmetic-related health problems.

Keywords: Self-Instructional Module; Cosmetics; Ill Effects; Knowledge; Adolescent Girls; Health Education

1. Introduction

Adolescence is a crucial transitional stage marked by significant physical, psychological, emotional, and social changes. During this period, adolescent girls become increasingly conscious of their appearance and often use cosmetic products such as face creams, lipsticks, eyeliners, perfumes, sunscreens, and facial cleansers. The growing influence of social media, peer pressure, celebrity endorsements, and advertising has substantially increased cosmetic use among adolescents worldwide.

Recent studies indicate a high prevalence of cosmetic use among young females. Chanie et al. (2025) reported that 81% of undergraduate female students regularly used cosmetics, with many experiencing adverse reactions such as skin rashes, itching, and irritation. Similarly, Senthilvel et al. (2025) found that most female students began using cosmetics after 15 years of age and commonly reported hair damage, skin itching, and discoloration. These findings highlight the widespread use of cosmetics and the associated health risks.

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Although cosmetics are generally considered safe, many products contain chemicals such as parabens, phthalates, formaldehyde-releasing preservatives, artificial fragrances, and heavy metals that may cause skin allergies, acne, pigmentation disorders, hormonal imbalance, and other health problems. Despite these risks, awareness regarding cosmetic safety remains inadequate among adolescents. Studies by Udayanga et al. (2024), Isai Amuthu et al. (2025), and Javvadi et al. (2023) revealed poor knowledge regarding cosmetic hazards, safe usage practices, and adverse effect reporting.

Health education through Self-Instructional Modules (SIMs) is an effective and cost-efficient method for improving knowledge and promoting safe health practices. Educating adolescent girls about the ill effects of cosmetic use can help them make informed decisions and prevent cosmetic-related health problems. Since limited studies have evaluated educational interventions on cosmetic safety, the present study was undertaken to assess the effectiveness of a Self-Instructional Module on knowledge regarding the ill effects of cosmetic usage on health among adolescent girls in a selected community at Coimbatore.

1.1. Statement of the problem

A study to assess the effectiveness of the self-instructional module on knowledge regarding the ill effects of cosmetic usage on health among adolescent girls in a selected community at Coimbatore.

Aim

To evaluate the effectiveness of the self-instructional module on improving knowledge regarding the ill effects of cosmetic usage on health among adolescent girls.

Objectives of the study

- To assess and compare the pre-test and post-test knowledge regarding the ill-effects of cosmetic usage on health among adolescent girls.
- To evaluate the effectiveness of the self-instructional module by comparing the pre-test and post-test knowledge regarding the ill effects of cosmetic usage on health among adolescent girls.
- To determine the association between the pre-test level of knowledge and selected demographic variables among adolescent girls.

Hypotheses

- **H₁:** There will be a significant difference in the mean knowledge score regarding the ill effects of cosmetic usage on health between the pre-test and post-test among adolescent girls in the experimental group.
- **H₂:** There will be a significant difference in the mean post-test knowledge score regarding the ill effects of cosmetic usage on health between adolescent girls in the experimental and control groups.
- **H₃:** There will be a significant association between the pre-test level of knowledge regarding the ill effects of cosmetic usage on health and the selected demographic variables among adolescent girls.

1.2. Operational Definition

1.2.1. Effectiveness

In the present study, effectiveness was defined as a significant improvement in adolescent girls' knowledge scores on the health effects of cosmetic use, measured by the difference between pre-test and post-test scores following administration of the self-instructional module.

1.2.2. Self-Instructional Module

Self-Instructional Module refers to systematically prepared educational material developed by the investigator, containing information about cosmetics, their ingredients, methods of use, and adverse health effects, which was provided to adolescent girls for self-learning.

1.2.3. Knowledge

Knowledge refers to the correct responses given by adolescent girls to the structured knowledge questionnaire on the health effects of cosmetic use, quantified as the scores obtained in the pre-test and post-test.

1.2.4. Ill Effects of Cosmetic Usage on Health

The ill effects of cosmetic usage on health refer to the harmful physical effects, such as skin allergies, irritation, pigmentation, acne, infections, hormonal disturbances, and other health-related problems caused by improper or excessive use of cosmetics.

1.2.5. Adolescent Girls

Adolescent girls are female individuals aged 17 to 19 years residing in the selected semi-urban community in Coimbatore.

1.2.6. Delimitation

- The study was delimited to adolescent girls residing in one selected semi-urban community.
- Adolescent girls aged 17 to 19 years

1.2.7. Assumptions

- Adolescent girls may use cosmetics in their daily lives.
- Adolescent girls should have some existing knowledge regarding cosmetics

2. Research methodology

2.1. Research Approach

Quantitative Evaluatory approach

2.2. Research Design

Quasi-experimental research design

2.3. Setting of the Study

Semi-urban Community, Sulur, Coimbatore

2.4. Population

Adolescent girls residing in the selected semi-urban community at Coimbatore

2.5. Sample Size

100 adolescent girls (Experimental Group: 50, Control Group: 50)

2.6. Sampling Technique

Non-probability convenience sampling technique

2.6.1. Inclusion Criteria

- Adolescent girls willing to participate in the study
- Adolescent girls who can able to read Tamil or English

2.6.2. Exclusion Criteria

- Adolescents with medical conditions
- Those unavailable during data collection in the selected community

2.6.3. Variables

- Independent Variable: Self-instructional module
- Dependent Variable: Knowledge regarding the ill effects of cosmetic usage on health

2.7. Tool for Data Collection

A structured questionnaire comprising two sections that include demographic data, and knowledge regarding the ill effects of cosmetic usage on health.

2.8. Validity and Reliability

Content validity was established by three experts. Reliability was assessed using the test-retest method, with r value= 0.84, indicating the tool was reliable.

2.9. Data Collection Procedure

Data were collected after obtaining informed consent from the participants. Prior to data collection, formal written permission was obtained from the Panchayat President after explaining the purpose and objectives of the study. The investigator introduced herself to the participants and explained the nature of the study. Baseline data were collected using a structured questionnaire. The pre-test was administered to both the experimental and control groups, and participants took approximately 20–30 minutes to complete it. Following the pre-test, the Self-Instructional Module (SIM) was distributed to the participants in the experimental group, while the control group did not receive any intervention. The post-test was conducted for both groups using the same questionnaire after one month to assess changes in knowledge. Confidentiality and anonymity of the participants were maintained throughout the study. At the completion of data collection, the investigator thanked the participants for their cooperation and assured them that the information provided would be used solely for research purposes.

2.10. Statistical Analysis

The collected data were coded, tabulated, and analyzed using descriptive and inferential statistics with SPSS version 22. The findings were presented in the form of tables and graphs. Frequency and percentage distributions were used to describe demographic variables and levels of knowledge. Mean and standard deviation were calculated to determine the knowledge scores. The paired t -test was used to compare the pre-test and post-test mean knowledge scores within the experimental and control groups. The unpaired t -test was used to compare the mean knowledge scores between the experimental and control groups. The chi-square test was applied to determine the association between post-test knowledge levels and selected demographic variables.

3. Results

The demographic and behavioral analysis revealed that most participants were between 18–19 years of age, accounting for 56% in the experimental group and 60% in the control group, indicating a largely homogeneous group of late adolescents. A higher proportion of respondents were from the Arts and Science stream (54% experimental; 60% control), followed by Design (20% experimental; 8% control) and Medical/Health Science (14% experimental; 22% control). Family income patterns showed that most belonged to the Rs 20,000–40,000 range (50% experimental; 52% control), followed by incomes above Rs 40,000 (44% experimental; 40% control), suggesting a predominantly middle-income demographic. All participants (100%) reported using cosmetics, with most applying them once daily (64% experimental; 74% control), while smaller proportions applied them twice daily (34% experimental; 24% control). Regarding product use, 52% of the experimental group and 76% of the control group used more than two items per day, while the rest used around two products. Ownership of a personal cosmetic kit was high, at 92% in the experimental group and 82% in the control group. Monthly expenditure on cosmetics was modest, with 52% of the experimental and 50% of the control group spending below Rs 500, while around 40–42% spent Rs 500–1,000. Brand preference was evident, as 78% of the experimental and 82% of the control group used branded cosmetics. The duration of cosmetic use indicated habituation, with 70% of the experimental and 82% of the control group using cosmetics for over one year. Major reasons for cosmetic use included skin protection and healing (48% experimental; 38% control), beauty and self-expression (20% experimental; 22% control), and simplified routine maintenance (14% experimental; 18% control). In terms of cosmetic information sources, social media dominated (56% experimental; 42% control), followed by advertisements (26% experimental; 28% control) and peer influence (10% experimental; 14% control), while traditional media and family guidance made up minor proportions. Overall, both groups demonstrated similar demographic characteristics and cosmetic-use patterns, showing that cosmetic use is widespread, normalized, and largely influenced by digital and peer networks among young adults.

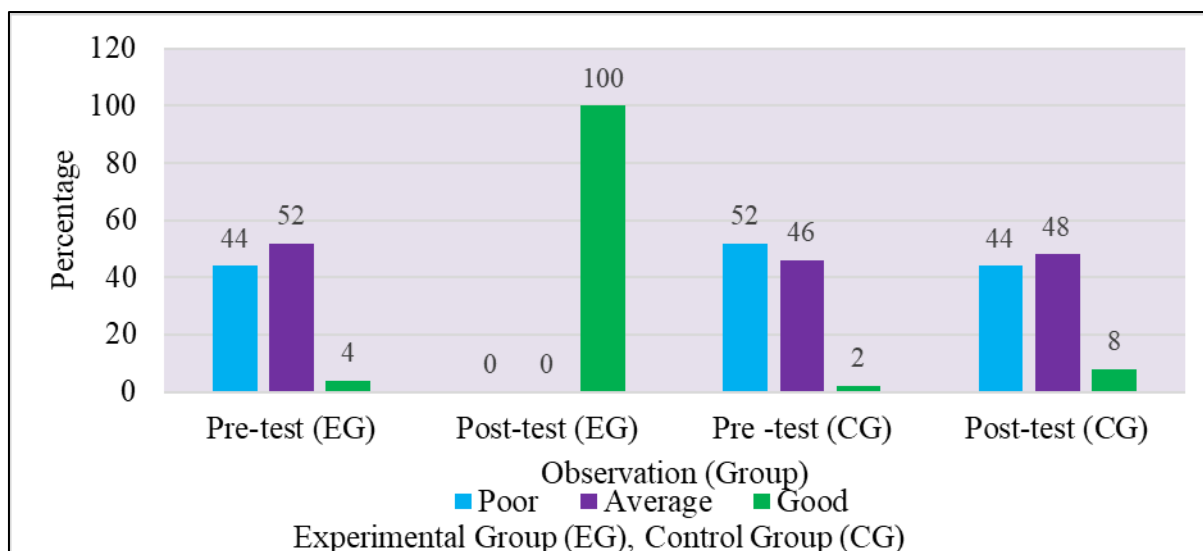


Figure 1 Percentage distribution of overall knowledge regarding the ill effects of cosmetic usage on health

The findings from figure 1, indicated that the intervention had marked improvement in the knowledge of adolescents in the experimental group, whereas the control group exhibited minimal change, thereby self-instructional module was effective to enhance the knowledge regarding the ill effects of cosmetic usage on health among adolescent girls.

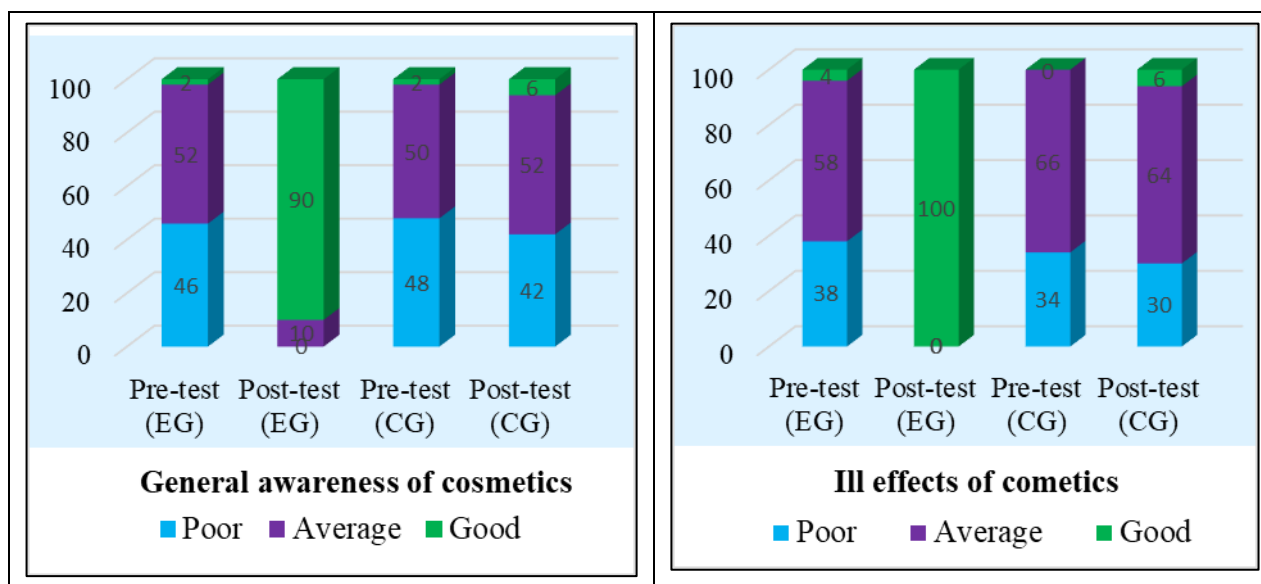


Figure 2 Percentage distribution on aspects of knowledge regarding the ill effects of cosmetic usage on health

The findings of figure 2, showed that the intervention had significantly improved the knowledge of adolescents in the experimental group regarding both general awareness and the ill effects of cosmetics, whereas the control group showed little improvement. The findings highlights that self-instructional module was effective to enhance the knowledge on all aspects regarding the ill effects of cosmetic usage on health among adolescent girls.

Table 1 Comparison of Mean Knowledge Score in Experimental and Control Groups in Pre-test and Post-test

Aspect of Knowledge	Observation	Experimental Group		Control Group		Unpaired t-value, df=98 (P Value)
		Mean $\pm$ SD	Paired t-value, df=49 (P Value)	Mean $\pm$ SD	Paired t-value	
General awareness of Cosmetics	Pre-test	4.04 $\pm$ 1.68	28.564 ** (P = 0.000)	3.96 $\pm$ 1.69	3.839 ** (P = 0.000)	0.238 NS (P = 0.813)
	Post-test	9.72 $\pm$ 1.03		4.30 $\pm$ 2.07		16.556 ** (P=0.000)
Ill effects of cosmetics	Pre-test	3.92 $\pm$ 1.72	31.717 ** (P = 0.000)	4.20 $\pm$ 1.76	1.498 NS (P = 0.141)	0.803 NS (P = 0.424)
	Post-test	10.80 $\pm$ 0.95		4.38 $\pm$ 1.97		20.783 ** (P=0.000)
Overall	Pre-test	7.96 $\pm$ 3.15	33.407 ** (P = 0.000)	8.16 $\pm$ 3.16	3.256 ** (P = 0.002)	0.316 NS (P=0.752)
	Post-test	20.52 $\pm$ 1.89		8.68 $\pm$ 3.85		19.542 ** (P=0.000)

NS – Not Significant at P<0.05, * - Significant at P<0.05, ** - Significant at P<0.01 df- degrees of freedom

The findings revealed that, in the experimental group, significant increases were observed in knowledge on general awareness (4.04 $\pm$ 1.68 to 9.72 $\pm$ 1.03), knowledge on ill effects of cosmetics (3.92 $\pm$ 1.72 to 10.80 $\pm$ 0.95), and overall knowledge (7.96 $\pm$ 3.15 to 20.52 $\pm$ 1.89), with highly significant paired t-values (P<0.001). In contrast, the control group showed only minimal improvement. The slight improvement observed in the control group's post-test knowledge scores was attributed to the testing effect, wherein exposure to the pre-test may increase participants to think and gain awareness related to cosmetic, from informal sources such as peers, family members, mass media, and social media during the study period. But the improvement was considerably lower than that observed in the experimental group. No significant differences existed between the groups during the pre-test, whereas highly significant differences were observed in the post-test (P<0.001). Hence, the hypothesis, H₁ and H₂ was accepted. These findings highlight that the self-instructional module was highly effective in improving adolescents' knowledge regarding cosmetic usage and its ill effects in the experimental group, in the various aspects and overall aspects of cosmetics.

Table 2 Association between the pre-test level of knowledge and selected demographic variables

Demographic Variables	Level of Knowledge			Chi-square Value (df =2)	P value
	Poor	Average	Good		
Have a personal cosmetic Kit					
No	10	2	1	7.147 *	0.028
Yes	38	47	2		
Use branded cosmetics					
No	15	4	1	8.421 *	0.015
Yes	33	45	2		

NS – Not Significant at P<0.05, * - Significant at P<0.05, df- degrees of freedom

The table 2, revealed that there was a statistically significant association between personal cosmetic kit and use of branded cosmetic with level of knowledge. Hence the hypothesis, H₃: There was a significant association between the pre-test level of knowledge regarding the ill effects of cosmetic usage on health and the selected demographic variables (personal cosmetic kit and use of branded cosmetic) among adolescent girls, was accepted.

4. Discussion

The present study findings showed that 52% of adolescent girls in the experimental group and 76% of participants in the control group reported using more than two cosmetic products per day, while the remaining participants used approximately two products daily. The study also revealed that in the pre-test, 44% of the adolescent girls had poor knowledge and 52% had a moderate level of knowledge regarding the ill effects of cosmetic usage on health. The findings of the present study are consistent with the study done by Udayanga L et al. (2024), that 96.4% of the participants used one or more cosmetic products, and approximately 47.5% exhibited a low level of knowledge regarding cosmetics and their potential adverse effects. The similarity between the findings of both studies indicates that inadequate knowledge regarding cosmetic use and its health implications remains a common concern among young population

5. Conclusion

The findings revealed that the following the administration of the self-instructional module, the experimental group demonstrated a remarkable improvement in knowledge scores, whereas the control group showed only minimal changes. The difference between pre-test and post-test knowledge scores in the experimental group was statistically highly significant ($P < 0.001$), indicating the effectiveness of the intervention. Additionally significant association was found between pre-test knowledge levels and use of branded cosmetics and personalised cosmetic kit. The study concludes that the self-instructional module is an effective, economical, and practical educational strategy for improving awareness regarding the ill effects of cosmetic usage on health among adolescent girls. Enhancing knowledge at an early age may promote informed decision-making, safe cosmetic practices, and the prevention of cosmetic-related health problems.

Nursing implications

The findings of the study have implications for nursing education, administration, practice, and research. In nursing education, the findings can be integrated into adolescent health education programs to promote awareness of safe cosmetic use. Nurse administrators can organize awareness programs on the harmful effects of cosmetics. In nursing practice, nurses can provide counseling and guidance regarding the safe use of cosmetic products. The study also highlights the need for further nursing research to identify effective strategies for improving adolescents' knowledge and awareness of cosmetic safety.

Limitations of the study

- The sample size was small, which restrict generalization of the results.
- The post-test was conducted within a limited period after the intervention; hence long-term retention of knowledge was not assessed.
- The study relied on self-reported responses, which may be subject to response bias.
- Non-probability convenience sampling was used, which may limit the representativeness of the sample.
- The study was done in semi-urban community, which restrict the generalisation of result to other community areas

Recommendations

Based on the findings of the study, it is recommended that similar studies be conducted with larger samples to improve generalizability. Longitudinal studies may be undertaken to assess the long-term health effects of cosmetic usage. Comparative studies between rural and urban adolescents and studies involving both male and female adolescents are also recommended. Furthermore, experimental studies can be conducted to evaluate the effectiveness of structured teaching programs in improving awareness regarding cosmetic safety and its health effects.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors declared that there are no financial conflicts of interest that could be perceived as influencing the reported research study.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

- [1] Senthilvel, H., T. S., and Grace, A. (2025) Cosmetic usage: Knowledge, attitude and behaviour among female college students in India. *Bioinformation*, 21(7), 1937–1941. <https://doi.org/10.6026/973206300211937>
- [2] Chanie, G. S., Simegn, W., Gedu, M., Nega, T., Chekol, N., and Birhanu, Z. (2025). Cosmetics Utilization Pattern, Perceived Adverse Effects and Identified Factors Among Final Year Under Graduate Female Students, University of Gondar, Ethiopia. *Journal of cosmetic dermatology*, 24(2), e70068. <https://doi.org/10.1111/jocd.70068>
- [3] Alnuqaydan A. M. (2024). The dark side of beauty: an in-depth analysis of the health hazards and toxicological impact of synthetic cosmetics and personal care products. *Frontiers in public health*, 12, 1439027. <https://doi.org/10.3389/fpubh.2024.1439027>
- [4] Ruby V.P., Liya M. Alias, Prabisha. E., Priya Prakash, Ragin Mariya, Rinta Sebastian, Riya Sebastian, Rosmol K. Joy, Sandra Sabu. Knowledge and Perception of the Ill Effects of Cosmetics Among Late Adolescent Girls. *International Journal of Women's Health Nursing And Practices*. 2023; 01(01):15-20. Available from: <https://journals.stmjournals.com/ijwhnp/article=2023/view=112743>
- [5] Udayanga L, Subashini N, Udugama M, Silva P and Ranathunge T (2024) Knowledge, perceptions, and consumption behaviour of cosmetics among undergraduates of Sri Lanka: a descriptive cross-sectional study. *Front. Public Health* 11:1184398. doi: 10.3389/fpubh.2023.1184398
- [6] Javvadi J, Syed MB, Kambar C, Lella M, Kurli S. A cross-sectional study to assess the knowledge, attitude, and practice of cosmetic use among 2nd-year medical undergraduate students in a tertiary care hospital. *Natl J Physiol Pharm Pharmacol*. 2023; 13(11): 2248-2253. doi:10.5455/njppp.2023.13.09441202326092023
- [7] Isai Amuthu B IAB, Vijayalakshmi S VS, Raja T.A.R RT, Senthil G SG, Razia A.R RA, Renuga Devi P RDP. A Cross-Sectional Survey-Based Study on Knowledge, Attitude and Practice Towards Cosmetic Usage and Cosmetovigilance Among Medical Students at a Tertiary Care Institute. *International Journal of Medical and Pharmaceutical Research*, 2025; 6(6), 155-160.
- [8] Kohli, R., Mittal, A., and Mittal, A. (2024). Adverse effects of Cosmetics on the Women Health. *BIO Web of Conferences*.
- [9] Lippincott Williams and Wilkins Journals. Awareness on cosmetic safety. [2025 Nov 6]; Available from: <https://journals.lww.com>
- [10] Dianitami, R., Rochadi, R.K., and Nurmaini, N. (2023). Influence of Attitudes and Cosmetic Advertisements on the Selection of Cosmetics Containing Harmful Ingredients by Adolescents in Medan City. *East Asian Journal of Multidisciplinary Research*, 2(11), 1-3