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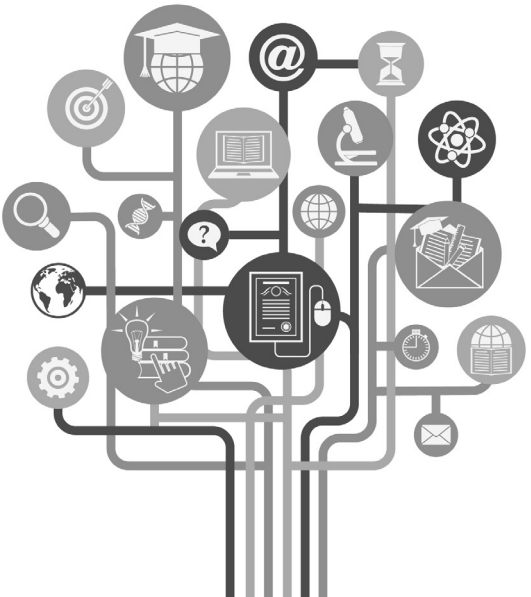

The Investigation of Adverse Effect from Using Cosmetics and Factors Affecting Buying Decisions and Willingness to Pay for Higher Price of Cosmetics in Thailand

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Abstract

At present, the competition in the cosmetics industry in Thailand is steadily intensifying as there is an ever-increasing demand for cosmetic products. The cosmetic companies and industries need to ensure safety and either eliminate or mitigate the after-effects of their products. The adverse reactions associated with the use of cosmetics have been critically considered as one of the crucial constituents of the cosmetics industry. The objectives of the study are to investigate the adverse effect from using cosmetics and factors affecting buying decisions and willingness to pay for higher price of cosmetics in Thailand. The cross-sectional study was conducted among women who suffered from the cosmetics-related after-effects. Based on the sample of 400 women who experienced adverse reactions from using cosmetics and skincare products, the results indicated that there were two factors playing crucial roles in the

consumers' decision to purchase cosmetics, these were: well-known brands and laboratory-tested products. These findings indicated that the respondents who had encountered the after-effects from using cosmetics concerned themselves about facing the adverse effects again in the future and the cosmetics that were laboratory-tested could improve the confidence of consumers: hence, they increased cosmetics consumption in turn. Moreover, the study revealed that respondents aged between 18-25 years old placed less importance on laboratory testing and had higher willingness to pay higher price for trusted brands than other age groups. In addition, the respondents with higher income tended to pay more attention to laboratory testing and were more willing to pay higher price for cosmetics and skincare products certified by the laboratory compared to the respondents with lower income. The results of this study can help the entrepreneurs in the cosmetic industry to 1) understand various factors affecting the buying decision and the willingness to pay higher price for cosmetic of consumers and 2) determine the target group to market the cosmetic products certified by laboratory tests.

Keywords : Adverse Reactions of Cosmetics and Skincare; Brand; Purchase Decision; Product Innovation

1. Introduction

Presently, the cosmetics industry in Thailand is growing robustly. The Centre of Economic and Business Forecasting under The University of Thai Chamber of Commerce (UTCC) has predicted that the cosmetics market in Thailand is expected to rise by 7.14 percent during 2019-2023. This seemed that this market represents a higher growth rate than the overall economic growth rate. Therefore, Thailand's cosmetics industry is still an opportunity for Thai entrepreneurs. Nonetheless, small and

medium enterprises or SMEs need to ensure the safety of their products by adopting the innovative technologies and sustainable development methods to serve the needs of consumers.

In the view of market value, the export value of cosmetics; soap, and skincare products showed a total export value in 2019 of 105,519 million Baht. This represented an increase of 7.15 percent compared to the previous year whereas the total exports of goods dropped by 1.07 percent. Therefore, the cosmetics business is an opportunity for Thai entrepreneurs, in both local and international context.

One of the important problems in cosmetic market is the adverse effect from using cosmetics. The adverse reactions associated with the use of cosmetics need utmost attention from entrepreneurs as it would severely affect brand image. The study found that 23 percent of women and 13 percent of men experienced after-effects associated with the use of cosmetics (Orton & Wilkinson, 2012). Therefore, product innovation is an essential step especially for the development of new cosmetic products to ensure product safety. The laboratory test is crucial to ensure and create confidence for consumers in marketing cosmetic products. In Thailand, there are a number of trustworthy laboratories both in the public and private sectors, including educational institutions which provide various types of testing to ensure product safety for example, the Cosmetic and Natural Products Research Center (CosNat) which is a division of the Faculty of Pharmaceutical Sciences, Naresuan University. The entrepreneur can use the service of the aforementioned laboratories in testing the cosmetics and skincare products to ensure product safety and reduce the risk of the adverse reactions associated with the use of cosmetics: consequently; consumers will gain the most benefit.

This study aimed to investigate consumer's adverse reactions associated with the use of cosmetics and skincare. Moreover, it aimed to

investigate factors affecting women's buying decision of cosmetic to illustrate whether the laboratory test is important to affect buying decision of cosmetic products. Moreover, the willingness to pay higher price and the responsiveness of consumers to high-priced cosmetics and skincare when these products are certified by trustworthy laboratories are investigated. The research questions include.

- Do the factors affecting buying decision of cosmetic products including laboratory test vary in different demographic groups?
- Do the factors affecting willingness to pay for higher price of cosmetics including laboratory test vary in different demographic groups?

The results of this study can help the entrepreneurs in the cosmetic industry to understand various factors affecting the buying decision and the willingness to pay higher price for cosmetic products including the laboratory test. Moreover, those entrepreneurs can understand the target group to market the cosmetic products certified by laboratory tests.

2. Literature Review

The term Cosmetics can be defined by Thailand Royal Institute Dictionary as "intended to be applied to the human body, face to improve or change appearance. They include powders, lipsticks, and eyebrow pencils" According to Thailand Cosmetic Act, the cosmetics can be defined as "The products intended to be applied to the human body through, rubbing for external use on various parts of body, skin, teeth, deodorant.

According to Thailand Ministry of Public Health (2019), the adverse reactions associated with the use of cosmetics mean "The adverse reactions is the unexpected reaction happens when consumer use of cosmetics that causes symptoms of the adverse effect from the use of cosmetic products" Based on the previous research, it was found that 23

percent of women and 13 percent of men experienced adverse events associated with the use of cosmetics and skin-care products (Orton & Wilkinson, 2012). Adverse effects related to the cosmetic use presents with various symptoms, including one or more of the following: peeling skin, skin redness, irritation, a skin rash, itching, contact dermatitis, redness caused by sun exposure (Pringpattanapong, 2008).

Although such symptoms are caused by sensory irritation, more than 10 percent of patients experiencing skin allergy caused by cosmetics (Orton & Wilkinson, 2012). However, the number of people who experienced adverse reactions associated with the use of specific cosmetics were less than the actual number that it would be, since some users tried to heal themselves without seeking a medical advice in case of minor illness (Di Giovanni et al., 2006). Therefore, having a procedure to examine cosmetics-related adverse events or Cosmetovigilance, and working in collaboration with the relevant sectors to reduce the likelihood of adverse reactions associated with the use of cosmetics and ensure product safety (Sautebin, 2007). The adverse reactions in the skin can be caused by many different chemical compounds such as allergy-causing fragrances that are used across many products due to temperature affects the rate at which chemical reactions take place (Cortez-Pereira, Baby & Velasco, 2010) Besides, scholar presented that cosmetic users experiencing skin allergy caused by cosmetics are partly due to the age range that showed the highest rate in using cosmetics. (Bilal et al., 2017).

For the factors affecting buying decisions and willingness to pay for cosmetic products, the brand was one of the most significant factors in deciding to purchase cosmetics (Krishnan et al., 2017). Li and Visitnikita (2017) studied factors influencing women to purchase cosmetics in Bangkok. The result presented that the quality of the product and the reliability and reputation of the brand were found to be the most significant factors.

The product safety is considered to be another important factor. Indra, Balaji, and Velaudham (2020) showed that the safety can significantly affect buying decision of cosmetics, which will lead to consumer satisfaction. Khan, Sarwar, and Tan (2021) studied the purchase intention of halal cosmetics and found that the safety can significantly affect purchase intention of cosmetics. In this study, the product safety is represented by the certification with laboratory test.

Another important factor is the price. Paomanacharoen (2019) studied consumers' online shopping of cosmetics in Bangkok and found that the price factor was important for buying decision of cosmetics. Moreover, the most important price factor was that the price is reasonable and matches with the quality of cosmetics.

The quality of cosmetics in form of key ingredients present in cosmetics was also the main factor, meanwhile, demographics were found to be slightly affect purchase decision. (Mansor, Ali & Yaacob, 2010). The results are consistent with another study which indicated that the use of cosmetics, especially luxurious cosmetics whose brands are associated with materialistic possession of users (Ajitha & Sivakumar, 2017).

Abdelazim Mohammed, Garcia Medina, and Garcia Romo (2018) showed that the visual element like the package of cosmetic products could affect the purchase intention of consumer. The color and material of cosmetic packages could affect the attractiveness and preference of cosmetic products, especially hairstyle, skincare, and makeup products. Sung (2021) also found that cosmetic packaging was crucial to customer buying decision and the important component of cosmetic package included color, shape, material, and artistic features.

Moreover, the presenter or the influencer can also affect buying decision of cosmetic products. Manvat et al. (2022) studied the impact

of influencer in cosmetic industry and reported the crucial role of influencers in various aspect to buying decision and brand loyalty of cosmetics. Chekima, Chekima, and Adis (2020) also showed that the role of presenters in terms of their expertise, trustworthiness, and attractiveness can significantly affect consumer attitude and purchase decision of cosmetics.

3. Methodology

3.1 Population and Sample

The target respondents were women who regularly use cosmetic products and have experience from the adverse reactions of using cosmetic products: therefore; the size of the population was unknown. The sampling method was as follows (Cochran, 1963).

$$n = \frac{Z^2 p(1-p)}{e^2}, \quad (1)$$

where n is the number of required samples, Z is the standard value from the normal distribution, p is the proportion of demographic characteristics of interest, and e is an acceptable tolerance level. From the above formula and the confidence level at 95 percent, the standard value of the normal distribution (Z) is 1.96, with a margin of error (e) of 5 percent. The proportion of population characteristics is unknown. Based on the principle of caution, the proportion of the population (p) was set at 0.50 to achieve the maximum number of samples. Therefore, the required sample size according to the formula was 384 respondents. Researchers adopted snowball sampling technique because this study focuses on those who had experience in adverse effect from using cosmetics. The snowball sampling technique allows the respondents to refer to other respondents who faced similar experiences of cosmetic adverse effect. The criteria were to select only females who regularly use

cosmetic and skincare products and have experience from the adverse reactions of using cosmetic products. The final sample size was 400 respondents.

3.2 Data collection method

The questionnaire consisting of a series of questions was employed as a data collection tool. The researcher used screening questions to select the respondents that matched the criteria. The series of questions were factors affecting cosmetics buying behavior, adverse reactions associated with the use of cosmetics, duration and cost of treatment owing to the after-effects, the willingness to pay higher price for the certified cosmetics tested by a trustworthy laboratory. Having finished responding to all questions, respondents were asked to refer to other female who regularly uses cosmetic products and also have experience from the adverse reactions of using cosmetic products.

3.3 Statistical Analysis

Descriptive statistical analysis was used to describe the collected data. The research hypotheses in this study were to examine the association between demographic and factors affecting buying decision of cosmetic products as well as factors affecting willingness to pay higher price for the certified cosmetics and skincare. From previous studies, the essential demographic that may affect buying decision of cosmetics includes age and income. The factor affecting buying decision included brand, safety (represented by laboratory testing in this study), price, quality, package, and presenter's credibility.

Therefore, there are 4 hypotheses to be examined as follows:

Hypothesis 1: There is an association between age and factors affecting buying decision of cosmetic products.

Hypothesis 2: There is an association between income and factors affecting buying decision of cosmetic products.

Hypothesis 3: There is association between age and factors affecting willingness to pay higher price for the certified cosmetics and skincare products.

Hypothesis 4: There is association between income and factors affecting willingness to pay higher price for the certified cosmetics and skincare products.

The Chi-square test of independence was used to test the above hypotheses. The Chi-square test of independence can examine the association between two categorical variables. However, the original Chi-square test is not appropriate for the multiple response questions because it may violate the assumption of data independence (Decady & Thomas, 2000). Therefore, the modified Chi-square statistics proposed by Louglin and Scherer (1998) should be used instead. The test statistics can be calculated as follows.

$$\chi^2 = \sum_{i=1}^{R}\sum_{j=1}^{C}\frac{(m_{ij} - F_{ij})^2}{F_{ij}} \qquad (2)$$

From the equation 2, m_{ij} is the observed count in i^{th} row and j^{th} column; R is the number of rows; C is the number of columns; F_{ij} is the expected count, which can be computed as follows.

$$F_{ij} = \frac{n_{i+}\, m_{j+}}{n_{++}}, \qquad (3)$$

where n_{i+} is total number of subjects in row i; m_{j+} is total number of responses in column j; n_{++} is total number of respondents. However, the test statistics from the multiple response questions does not have asymptotic Chi-square distribution. Louglin and Scherer (1998) proposed to apply the procedure developed by Rao & Scott (1981) by adjusting the test statistics to follow the asymptotic Chi-square distribution as follows.

$$\chi_c^2 = \frac{\chi^2}{1 - \frac{m_{++}}{n_{++}\, C}}, \qquad (4)$$

where m_{++} is total number of responses; n_{++} is total number of respondents; and C is the number of columns. This test statistics follow Chi-square distribution with the degree of freedom of $(R - 1)C$.

4. Results

4.1 Sample Profile

The demographic profile, i.e. age, monthly income, and occupation of respondents is reported in Table 1.

Table 1 Demographics

Demographics	Demographics	Count	Percentage
Age	18 – 25 years old	78	19.50%
	26 – 35 years old	214	53.50%
	36 – 45 years old	108	27.00%
Monthly Income	Less than 15,000 Baht	10	2.50%
	15,001 – 30,000 Baht	118	29.50%
	30,001 – 50,000 Baht	129	32.25%
	50,001 – 100,000 Baht	133	33.25%
	More than 100,000 Baht	10	2.50%
Occupation	Office employee	220	55.00%
	Student	69	17.25%
	Freelance	61	15.25%
	Civil servant	45	11.25%
	Other	5	1.25%

4.2 Adverse Reactions from Cosmetics and Skincare Products

This part is the results of adverse reactions that people experienced from using cosmetics and skincare products including the origin of products, types of products, adverse reactions, period of recovery, and medical treatment expenditures. The results are reported in Table 2 to Table 6.

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Table 2 Origin of cosmetic and skincare products causing the adverse reactions

Origin	Count	Percentage
Local products	348	87.00%
Imported products	316	79.00%

From Table 2, majority of respondents have experienced about adverse reactions of cosmetics and skincare products caused by local product or import product, 87 percent and 79 percent respectively. Therefore, most respondents are more likely to face the adverse reactions from using local products more than imported product, though the number seems to be marginally different.

Table 3 Type of cosmetic and skincare products causing the adverse reactions

Type of Products	Count	Percentage
Makeup product	296	74.00%
Skincare product	259	64.75%
Cleansing product	276	69.00%

Note: The respondent can select more than one option

From Table 3, 74.00 percent of respondents reported that their experience about the adverse reactions caused by makeup product, 69.00 percent of respondents were caused by cleansing products, and 64.75 percent of respondents were caused by skincare product. It can be seen that respondents are more likely to face the adverse reactions from using makeup product rather other types.

Table 4 Adverse reactions

Adverse Reactions	Count	Percentage
Peeling skin	265	66.25%
Itching	264	66.00%
Contact dermatitis	230	57.50%
Skin rash	202	50.50%

Note: The respondent can select more than one option

Table 4 reported the adverse effects of using cosmetics and skincare of the respondents. 66.25 percent of respondents had peeling skin, 66.00 percent of respondents had itching, 57.50 percent of respondents had contact dermatitis, and 50.50 percent of respondents had skin rash. Most respondents faced the adverse reactions in form of peeling skin and itching.

Table 5 Recovery period from adverse reactions

Recovery Period	Count	Percentage
1-2 days	4	1.00%
3-4 days	19	4.75%
1-2 weeks	74	18.50%
3-4 weeks	85	21.25%
2-3 months	170	42.50%
More than 3 months	48	12.00%

From Table 5, when respondents were asked about recovery period for the adverse reactions, 42.50 percent of respondents reported that it took 2-3 months for recovery, 21.25 percent of respondents reported that 3-4 weeks for recovery, and 18.50 percent of respondents reported that 1-2 weeks for recovery. Therefore, most respondents spent around 2-3 months to cover from the adverse reactions from using cosmetics and skincare products.

Table 6 Medical treatment expenditure for adverse reactions

Medical Treatment Expenditure	Count	Percentage
Less than 1,000 Baht	28	7.00%
1,000 – 3,500 Baht	309	77.25%
3,501 – 5,000 Baht	40	10.00%
5,001 – 7,500 Baht	16	4.00%
7,501 – 10,000 Baht	4	1.00%
More than 10,000 Baht	3	0.75%

From Table 6, when respondents were asked about medical treatment expenditure, most respondents had to spend around 1,000 – 3,500 Baht for the medical treatment for the adverse reactions from using cosmetics and skincare products.

4.4 Factors Affecting Buying Decision of Cosmetic Products

There are 6 factors that may affect the buying decision of cosmetic products including brand, laboratory testing, price, quality, package, and presenter's credibility. The results are reported in Table 7.

Table 7 Factors affecting cosmetics buying decision

Factors	Count	Percentage
Brand	337	84.25%
Laboratory Testing	294	73.50%
Price	263	65.75%
Quality	256	64.00%
Packaging	95	23.75%
Presenter's credibility	57	14.25%

Note: The respondent can select more than one option

From Table 7, when respondents were asked about factors affecting cosmetics buying decision, most respondents give importance to brand in making decision to buy cosmetics. Choosing cosmetics based on brand may help them feel more confident in buying cosmetics. It is interesting that the second important factor is laboratory testing. Therefore, the cosmetics with laboratory testing can also help creating confidence in buying cosmetics. The association between factors affecting cosmetics buying decision and demographic factors like age and income are reported in Table 8 and Table 9.

Table 8 Association between age and factors affecting cosmetics buying decision

Age	Brand	Laboratory	Price	Quality	Packaging	Presenter
18-25 years						
Count	62	50	47	49	25	5
Percentage	79.5%	64.1%	60.3%	62.8%	32.1%	6.4%
26-35 years						
Count	185	162	146	147	47	34
Percentage	86.4%	75.7%	68.2%	68.7%	22.0%	15.9%
36-45 years						
Count	90	82	70	60	23	18
Percentage	83.3%	75.9%	64.8%	55.6%	21.3%	16.7%
Whole Sample						
Count	337	294	263	256	95	57
Percentage	84.3%	73.5%	65.8%	64.0%	23.8%	14.3%

Note: The percentage row represents the percentage of total number of respondents in such group.

The modified chi-square statistic is 18.67 and the p-value is 0.09.

From Table 8, the modified Chi-square test of association proposed by Louglin and Scherer (1998) was used to examine the association between age and factor affecting cosmetics buying decision. The test statistics based on the modified Chi-square was 18.67 with the p-value is 0.09, which is not statistically significant at 5 percent level. Therefore, there was no significant association between age and factor affecting cosmetics buying decision.

Overall, brand was the most important factor in all age groups, while the laboratory testing was a second most important factor in all age groups as well. However, the result indicated that respondents aging between 18-25 years old placed less importance to the laboratory testing than other groups. The third most important factor was price, and the fourth one was quality. Respondents aging between 36-45 years old were more concerned about price than quality, whereas the other two groups including 18-25 years old and 26-35 years old were somewhat indifferent in term of these two factors. While the presenter's creditability was the least important factor for all age groups, only 6.4 percent of respondents who were 18-25 years old chose the presenter's creditability compared to 14.3 percent of respondents for the whole sample. This shows that younger respondents pay attention even less for the presenter's creditability for making a decision in buying cosmetics.

Table 9 Association between income and factors affecting cosmetics buying decision

Income (Baht)	Brand	Laboratory	Price	Quality	Packaging	Presenter
< 15,000						
Count	7	7	9	9	2	1
Percentage	70.0%	70.0%	90.0%	90.0%	20.0%	10.0%
15,000–30,000						
Count	89	70	63	76	20	4
Percentage	75.4%	59.3%	53.4%	64.4%	16.9%	3.4%
30,000–50,000						
Count	116	94	88	90	31	18
Percentage	89.9%	72.9%	68.2%	69.8%	24.0%	14.0%
50,000–100,000						
Count	117	119	99	72	41	33
Percentage	88.0%	89.5%	74.4%	54.1%	30.8%	24.8%
> 100,000						
Count	8	4	4	9	1	1
Percentage	80.0%	40.0%	40.0%	90.0%	10.0%	10.0%
Whole Sample						
Count	337	294	263	256	95	57
Percentage	84.3%	73.5%	65.8%	64.0%	23.8%	14.3%

Note: The percentage row represents the percentage of total number of respondents in such group.

The modified chi-square statistic is 130.79 and the p-value is less than 0.01.

From Table 9, the modified Chi-square test of association proposed by Louglin and Scherer (1998) was used to examine the association between income and factor affecting cosmetics buying decision. The test statistics based on the modified Chi-square was 130.79 with the p-value less than 0.001. Therefore, there was the significant association between income and factor affecting cosmetics buying decision.

Overall, brand was still the most important factor in almost all income levels, while the laboratory testing was still the second most

important factor as well. Most respondents, i.e. 89.50 percent, of respondents with income 50,000 – 100,000 Baht place importance on the laboratory testing compared to only 59.30 percent of respondents with income 15,000 – 30,000. Therefore, the respondents with income 50,000 – 100,000 Baht tends to place more importance to the laboratory testing compared to other income groups.

4.5 Factors Affecting Willingness to Pay Higher Price

There are 6 factors that might affect the willingness to pay higher price for cosmetics and skincare products including no adverse reactions, laboratory testing, trusted brand, higher quality, nice package, product imported, and presenter's credibility. The results are reported in Table 10.

Table 10 Factors affecting willingness to pay higher price

Factors	Count	Percentage
No Adverse Reactions	316	79.00
Laboratory Testing	297	74.25
Trusted Brand	283	70.75
Higher Quality	259	64.75
Nice Package	223	55.75
Presenter's credibility	57	14.25

Note: The respondent can select more than one option

From Table 10, when respondents were asked about factors would induce their willingness to pay higher price for cosmetics and skincare products, most respondents were willing to pay higher price for cosmetics and skincare products that has no adverse reactions. In conjunction with the earlier results regarding the factor affecting buying decision, these findings affirmed that cosmetics users who used to experience the adverse reactions from using cosmetics were most worried about the adverse reactions and were willing to pay higher price to avoid such adverse reactions. Moreover, the second most important factor inducing willingness

to pay higher price was laboratory testing which can help creating confidence that they would be less likely to face the adverse reactions from buying cosmetics and skincare products which have passed the laboratory testing. The association between factors affecting cosmetics buying decision and demographic factors like age and income are reported in Table 11 and Table 12.

Table 11 Association between age and factors affecting willingness to pay higher price

Age	No Adverse	Laboratory	Brand	Quality	Package	Presenter
18-25 years						
Count	49	51	60	52	43	5
Percentage	62.8%	65.4%	76.9%	66.7%	55.1%	6.4%
26-35 years						
Count	170	166	152	129	141	37
Percentage	79.4%	77.6%	71.0%	60.3%	65.9%	17.3%
36-45 years						
Count	97	80	71	78	39	15
Percentage	89.8%	74.1%	65.7%	72.2%	36.1%	13.9%
Total						
Count	316	297	283	259	223	57
Percentage	79.0%	74.3%	70.8%	64.8%	55.8%	14.3%

Note: The percentage row represents the percentage of total number of respondents in such group.

The modified chi-square statistic is 54.27 and the p-value is less than 0.01.

From Table 11, the modified Chi-square test of association proposed by Louglin and Scherer (1998) was used to examine the association between income and factors affecting willingness to pay at a higher price. The test statistics based on the modified Chi-square was 54.27 with the p-value less than 0.001. Therefore, there was a significant association between age and factors affecting willingness to pay at a higher price.

Most of respondents aging between 26-35 years and 36-45 years were willing to pay higher price when cosmetics and skincare products had no adverse reactions, and the product safety or efficacy was proved by laboratory testing. However, most of respondents aging between 18-25 years were willing to pay higher price because of trusted brand. This result is consistent with the earlier result showing that respondents aging between 18-25 years old paid less attention to the laboratory testing than other groups. Therefore, these findings support that these 2 age groups (26-35 and 36-45) trust that using cosmetics and skincare products that passed the laboratory testing can reduce the likelihood of facing adverse reactions and were willing to pay higher price for the certified cosmetics and skincare products. However, those who were between 18-25 years old did focus on the trusted brand rather than the laboratory testing.

Table 12 Association between income and factors affecting willingness to pay higher price

Income (Baht)	No Adverse	Laboratory	Brand	Quality	Package	Presenter
< 15,000						
Count	7	6	9	8	5	1
Percentage	70.0%	60.0%	90.0%	80.0%	50.0%	10.0%
15,000–30,000						
Count	72	72	96	80	63	2
Percentage	61.0%	61.0%	81.4%	67.8%	53.4%	1.7%
30,000–50,000						
Count	107	102	85	90	70	19
Percentage	82.9%	79.1%	65.9%	69.8%	54.3%	14.7%
50,000–100,000						
Count	122	113	88	75	84	34
Percentage	91.7%	85.0%	66.2%	56.4%	63.2%	25.6%
> 100,000						
Count	8	4	5	6	1	1
Percentage	80.0%	40.0%	50.0%	60.0%	10.0%	10.0%

Table 12 Association between income and factors affecting willingness to pay higher price (Contiune)

Income (Baht)	No Adverse	Laboratory	Brand	Quality	Package	Presenter
Total						
Count	316	297	283	259	223	57
Percentage	79.0%	74.3%	70.8%	64.8%	55.8%	14.3%

Note: The percentage row represents the percentage of total number of respondents in such group.

The modified chi-square statistic is 103.87 and the p-value is less than 0.01.

From Table 12, the modified Chi-square test of association proposed by Louglin and Scherer (1998) was used to examine the association between income and factors affecting willingness to pay at a higher price. The test statistics based on the modified Chi-square was 103.87 with the p-value less than 0.001. Therefore, there was a significant association between income and factors affecting willingness to pay at a higher price.

The factor that rendered consumers' willingness to pay higher price was cosmetics and skincare products that did not cause adverse reactions, especially those with incomes of more than 30,000 Baht. Respondents with income more than 30,000 Baht were willing to pay higher price for cosmetics and skincare products certified by laboratory testing. Meanwhile, respondents with income less than 30,000 Baht were willing to pay higher price for cosmetics and skincare products because of trusted brand. This result is consistent with the earlier result about the factors affecting a decision to buy cosmetics and skincare products. Higher income respondents tend to pay more attention to laboratory testing and are more willing to pay higher price for cosmetics and skincare products with laboratory testing compared to respondents with lower income.

5. Conclusion and recommendation

It is beneficial to society for the body of knowledge divulged by this study as it creates an understanding of the consumers' attitude towards the use of cosmetics and understand the nature of adverse reactions and incurred cost when consumers experience adverse reactions related to the use of cosmetics. The result showed that brand is the most significant factor influencing cosmetics buying decision, which is consistent with the previous study (Krishnan et al., 2017; Visitnikita, 2017).

Overall, brand was the most important factor in all age groups, while the laboratory testing was the second most important factor in all age groups as well. This implies that cosmetics users who used to face the adverse reactions from using cosmetics are worried about facing the adverse reactions again in the future. Choosing cosmetics based on trusted brand may help them feel more confident in buying cosmetics. The cosmetics with laboratory testing can also help creating confidence in buying cosmetics.

Respondents aging between 26-35 years and 36-45 years placed importance to laboratory testing and were willing to pay higher price when cosmetics and skincare products passed laboratory testing. However, respondents aging between 18-25 years old paid less attention to the laboratory testing and consequently had willingness to pay higher price less than other age groups. In addition, brand was still the most important factor in almost all income levels, while the laboratory testing was the second most important factor. Respondents with higher income tended to pay more attention to laboratory testing and were more willing to pay higher price for cosmetics and skincare products certified by laboratory testing compared to respondents with lower income.

The factor that rendered people willingness to pay higher price was cosmetics and skincare products that do not cause adverse reactions,

especially those with incomes of more than 30,000 Baht. Respondents with income more than 30,000 Baht were willing to pay higher price for cosmetics and skincare products certified by laboratory testing. Meanwhile, respondents with income less than 30,000 Baht were willing to pay higher price for cosmetics and skincare products because of trusted brand. This result is consistent with the earlier result about the factors affecting a decision to buy cosmetics and skincare products. Higher income respondents tended to pay more attention to laboratory testing and were more willing to pay higher price for cosmetics and skincare products with laboratory testing compared to respondents with lower income.

The study also disclosed about the adverse reactions associated with the use of cosmetics and skincare cream in which the findings are consistent with previous study (Orton & Wilkinson, 2012). In term of the adverse reactions associated with the use of cosmetics, these symptoms included peeling skin, itching, and contact dermatitis which supported the previous finding (Pringpattanapong, 2008). In addition, this study affirmed that if the product has been tested and certified by a trustworthy laboratory, people are willing to pay higher rate for those cosmetic products.

This finding supports the previous paper that worked in collaboration with the relevant sectors to reduce the likelihood of adverse reactions associated with the use of cosmetics and to ensure product safety (Sautebin, 2007). Last but not least, those who were between 26-45 years old and those who had income more than 30,000 Baht were willing to pay higher price for the cosmetics causing no adverse reactions and cosmetics tested and certified by the credential laboratory. This finding supports the previous study that the key ingredients presented in cosmetics was also the main factor affecting purchase decision (Mansor, Ali & Yaacob, 2010).

The limitation of this study is that the snowball sampling technique was employed because the study aimed to focus on only those who used to experience the adverse effects from using cosmetics. Therefore, the demographic groups do not distribute evenly. Consequently, the uneven distribution of the demographic groups may affect the results. For the age group, the sample was concentrated on those who are 26-35 years old because this group may have most experience in cosmetic adverse effects. Although the age groups do not distribute evenly, the number of samples in each group was not too small e.g. the age group between 18-25 year old consisted of 78 respondents. However, the interpretation of monthly income groups for the groups with income less than 15,000 and income more than 100,000 Baht needs to be carried out with caution as there are only 10 respondents in those groups. Nevertheless, removing these two groups will not alter the statistical significance of the modified Chi-square test of association proposed by Louglin and Scherer (1998). Therefore, the results for other income groups are still statistically valid.

The findings of this study contribute to the adoption of the right marketing strategies for the cosmetics & skincare entrepreneurs in term of product, price, and promotion. This is to recommend that the entrepreneurs should be innovative in developing new cosmetic and/or skincare products to ensure product safety. Also, they should work in close collaboration with the relevant sectors, e.g., government agencies, educational institutions, that support them in term of laboratory testing service to test and certify the products to ensure product safety. This can reduce the likelihood of adverse reactions associated with the use of cosmetics. Last but not least, the entrepreneur should receive support or grant from the government agencies, especially in term of laboratory testing to develop products that possess competitive advantage to enhance international competitiveness and create sustainable value-added.

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