



## Psychological Effects of Nail Color

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### ABSTRACT

**Introduction:** Nail polish is a cosmetic used to apply color for beautifying fingernails and toenails. Nail polish may be provided benefits as color therapy for balancing psychological problems.

**Objective:** The objective of this study was to find the benefit of colors from nail polish application based on the theory of color therapy.

**Methods:** The participants were 200 female students at Mae Fah Luang University. They were divided into 2 groups; blinded and unblinded by their perception of color therapy. The participants applied their nails with different colors based on their emotions and determined the color effects after 1 week of application by answering the questionnaires.

**Results:** The results found that the main problems of participants were depression (13.00%), rough (12.50%), complicated (11.50%), and lack of confidence (10.50%), respectively. The score of the emotion of each participant was determined before and after nail polish application and found a significant decrease ( $p < 0.05$ ) in the emotion problem after the experiment. State-Trait Anxiety Inventory (STAI) and Beck Anxiety Inventory (BAI) were used to measure anxiety levels and found a significant decrease ( $p < 0.05$ ) in both scores after nail polish application. The positive psychological effects of nail color were found in both groups without any bias in the results. In addition, most of the participants were satisfied with their nail colors and half of them felt a change in their emotions after nail polish application.

**Conclusion:** Nail color applications help to improve the emotion and decrease the anxiety levels of participants.

**Keywords:** Anxiety; Color therapy; Emotions; Nail polish; Psychological

### Introduction

Anxiety is a universal human emotion defined as a displeasing feeling of uneasiness, nervousness, apprehension, fear, concern, or worry [1]. There are two main symptoms of anxiety; emotional sensation and physical sensation. Anxiety affects emotional sensations such as nervousness, worry, irritability, self-consciousness, and fear. Anxiety might be leading to physical sensations such as headache, nausea, sweating, hot flashes or chills, vomiting, and increasing blood pressure [2]. Anxiety affects one-eighth of the total population worldwide and has become a significant area of research interest in psychopharmacology [3]. There are many ways to reduce anxiety such as relaxation techniques, herbal medicine, yoga, massages, hypnosis, chiropractic, spiritual healing by others, folk remedies, homeopathy and psychological treatments [4].

Color therapy is one type of psychological treatment. Color therapy is the use of vibration frequency of the spectrum to correct imbalance or disharmony in the human body. The brain perceives these different wavelengths as different colors then the eyes will translate the energy of the light into the nervous impulse, which the brain then interprets as color. These energies outside not only visible but also conscious color vision affect both mind and body which can have an effect on the physical, mental and emotional state [5]. Color therapy can be used for balancing or preventing psychological problems. The impact of color on mood is widely recognized. It is also considered a holistic therapy that activates the body's healing process.

Color may influence a range of psychological, physiological, and behavioral responses [6]. For

example, blue is the intellect color which may improve cognitive performance, consciousness and intellectual. Red is the color of energy that is associated with movement and excitement. Yellow is the color of confidence. Pink is the color of romance. Orange is the color of joy, fun, and happiness. Green is a color of calm. Black is a color of security. Brown is a color of stability. Violet is a color of authenticity and truth. Grey is a color of neutrality and balance [7].

Nail polish is a cosmetic used to apply to human fingernails and toenails to protect and beautify nails. Nail polish consists of lacquer combined with color pigments and several other components, depending on the brand. Nail polish became one of the necessities in women's color cosmetics by the 1940s [8]. Nowadays, nail polish is receiving more attention among consumers. There are various factors for nail polish selection. These factors are color, trend, season, application, and age of consumers [9]. Color is one of the most important factors that affect nail polish selection. Consumers may focus more on color than brand.

The objective of this study was to find the benefit of color nail polish based on the theory of color therapy. The participants applied their nails with different colors based on their emotional problems and determined the color effects by answering the questionnaire. The result from this study might be useful for further use in advertising and marketing nail polish.

## Methodology

### Materials

Nail polishes were purchased from Yves Rocher Co., Ltd. The colors of nail polishes were yellow, red, pink, blue, orange, green, black, brown, violet, and grey.

### Participants

The participants in this study consisted of 200 female students in Mae Fah Luang University, aged 18-30 years who have no history of any dermatological diseases or nail polish allergies.

The participants were divided into 2 groups, 100 participants per group. Group 1 was a blinded group who did not know about the psychological effects of color, and group 2 was unblinded group who know about the psychological effects of color.

This study was approved by the Ethics in Human Research Committee of Mae Fah Luang University (No. REH-59093). All volunteers received information about the study and signed an informed consent sheet.

### Research instrument design

A questionnaire was used to study the effects of nail colors on participants before and after nail polish application. The questionnaire was divided into three parts;

Part 1: Compose the general information of participants such as age, education level, school, frequency of nail polish application, knowledge about color therapy, and factors to select nail polish colors.

Part 2: Compose emotional problems of participants, problem level, feelings, and satisfaction before and after nail polish application.

The emotional problem of each participant was used as criteria for selecting the nail color and shown in table 1.

**Table 1** The relationship between psychological problems and color therapy [7].

Emotional problems	Color
Lack of confidence	Yellow
Depressed	Red
Rough	Pink
Complicated	Blue
Solitary	Orange
Anxious	Green
Suspicious	Black
Weak	Brown
Confused	Violet
No problem	Grey

The satisfaction level before and after the nail polish application has 6-points Likert scale. The criteria interpretations for the satisfaction level was 6 levels as following; 5.19-6.00 (very high), 4.35-5.18 (high), 3.51-4.34 (Medium), 2.68-3.50 (low), 1.84-2.67 (very low), 1.00-1.83 (dissatisfied).

Part 3: Compose the State-Trait Anxiety Inventory (STAI) [10] and Beck Anxiety Inventory (BAI) [11].

The participants were asked to complete STAI and BAI before and after the nail polish application.

STAI is a self-report to measure the presence and severity of emotional symptoms of anxiety. The STAI is composed of 40 items for measuring State Anxiety (S-Anxiety) and Trait Anxiety (T-Anxiety). S-Anxiety is the intensity of the current feeling composed of 20 items for assessing tension, nervousness, worry, apprehension, and activation or arousal of the autonomic nervous system. T-Anxiety is the relatively stable aspect of anxiety proneness composed of 20 items including general states of calmness, confidence, and security [12].

BAI consists of 21 self-reported items (4-points scale) used to assess the intensity of physical and cognitive anxiety symptoms during the past week while minimizing their relationship with depression. The measurement includes assessment of symptoms such as nervousness, dizziness, and inability to relax. Scores may range from 0 to 63: minimal anxiety levels (0-7), mild anxiety (8-15), moderate anxiety (16-25), and severe anxiety (26-63) [12].

### Data analysis

The results such as mean, frequency, standard deviations, and percentage were calculated by Microsoft excel 2010. The statistical analysis was determined by the independent-samples T-test and paired-samples T-

test via the program IBM SPSS statistics version 21 (Trial version).

## Results

### Emotional problems

The survey about emotional problems found that 33% of group 1 and 18% of group 2 did not have emotional problems. The participants in this group applied their nails with a grey color. However, 67% of

group 1 and 82% of group 2 had emotional problems as shown in table 2. Most of the participants in group 1 felt complicated (13%) and participants in group 2 felt depressed (16%). In addition, the main problems of participants were depression (26 participants, 13%), rough (25 participants, 12.50%), complicated (23 participants, 11.50%), and lack of confidence (21 participants, 10.50%), respectively.

**Table 2** Emotional problems of participants.

Emotional problems	Group 1 (%)	Group 2 (%)	Total n (%)
Depressed	10	16	26 (13.00)
Rough	10	15	25 (12.50)
Complicated	13	10	23 (11.50)
Lack of confidence	11	10	21 (10.50)
Confused	6	12	18 (9.00)
Anxious	8	6	14 (7.00)
Solitary	6	5	11 (5.50)
Weak	1	7	8 (4.00)
Suspicious	2	1	3 (1.50)
No problem	33	18	51 (25.50)

### The score of emotional problems before and after nail polish application

The level of emotional problems was examined before and after the nail polish application. Table 3 showed that after 1 week of nail polish application, the participants in both groups had significantly decreased their emotional problems scores ( $p < 0.05$ ). The participants of group 1 showed a significant decrease ( $p < 0.05$ ) in problems such as depression, roughness,

complicated, lack of confidence, and anxiety after nail polish application. In group 2, the participants showed a significant decrease ( $p < 0.05$ ) in problems such as depression, roughness, confusion, anxiety, and weakness after nail polish application. In addition, the participant in group 1 felt significantly reduced ( $p < 0.05$ ) in their depression emotion more than the participants in group 2.

**Table 3** Score of emotional problems before and after nail polish application

Problem	Group 1 (Blinded)			Group 2 (Unblinded)		
	Before	After	$\Delta$ Change	Before	After	$\Delta$ Change
Depressed	3.80 $\pm$ 1.03	1.80 $\pm$ 0.79*	2.00 $\pm$ 0.24 <sup>a</sup>	3.56 $\pm$ 0.73	2.19 $\pm$ 0.98*	1.38 $\pm$ 0.25
Rough	3.90 $\pm$ 0.99	2.30 $\pm$ 0.82*	1.60 $\pm$ 0.17	3.67 $\pm$ 0.90	2.47 $\pm$ 0.64*	1.20 $\pm$ 0.26
Complicated	3.92 $\pm$ 0.95	3.31 $\pm$ 0.75*	0.62 $\pm$ 0.20	3.20 $\pm$ 0.92	2.60 $\pm$ 1.26	0.60 $\pm$ 0.35
Lack of confidence	3.18 $\pm$ 0.60	2.18 $\pm$ 0.75*	1.00 $\pm$ 0.15	3.20 $\pm$ 1.40	2.30 $\pm$ 1.25	0.90 $\pm$ 0.15
Confused	3.83 $\pm$ 0.98	3.17 $\pm$ 1.17	0.67 $\pm$ 0.19	3.17 $\pm$ 0.94	2.67 $\pm$ 1.23*	0.50 $\pm$ 0.29
Anxious	3.50 $\pm$ 1.31	2.25 $\pm$ 1.04*	1.25 $\pm$ 0.27	3.67 $\pm$ 0.52	2.50 $\pm$ 0.84*	1.17 $\pm$ 0.32
Solitary	3.33 $\pm$ 0.52	3.33 $\pm$ 0.52	0.00 $\pm$ 0.00	3.20 $\pm$ 0.45	2.60 $\pm$ 1.52	0.60 $\pm$ 1.07
Weak	3.00 $\pm$ 0.00	3.00 $\pm$ 0.00	0.00 $\pm$ 0.00	3.43 $\pm$ 0.79	2.00 $\pm$ 1.54*	1.43 $\pm$ 0.37
Suspicious	2.50 $\pm$ 0.71	1.50 $\pm$ 0.71	1.00 $\pm$ 0.00	3.00 $\pm$ 0.00	2.00 $\pm$ 0.00	1.00 $\pm$ 0.00

\* Significant change ( $p < 0.05$ ) when compared with before nail polish application

<sup>a</sup> Significant change ( $p < 0.05$ ) when compared with group 2. Data expressed as mean  $\pm$  S.D.

### The score of anxiety levels before and after nail polish application

The results in table 4 showed the anxiety level before and after nail polish application. The scores were determined by using the questionnaire of STAI and BAI. The results found that STAI scores were significantly reduced after nail polish application in both groups ( $p < 0.05$ ) while BAI scores were also reduced in both groups but significantly reduced in group 2 ( $p < 0.05$ ).

S-Anxiety were decreased from 42.08 $\pm$ 7.03 to 40.42 $\pm$ 5.52 in group 1 and decreased from 44.15 $\pm$ 5.68 to 41.73 $\pm$ 5.29 in group 2. T-Anxiety were decreased from 43.86 $\pm$ 6.23 to 43.80 $\pm$ 5.19 in group 1 and decreased from 45.37 $\pm$ 5.30 to 44.12 $\pm$ 3.91 in group 2.

BAI score was reduced from 24.01 $\pm$ 8.60 to 23.04 $\pm$ 6.96 in group 1 and significantly reduced from 24.00 $\pm$ 7.56 to 21.63 $\pm$ 7.25 in group 2.

**Table 4** The score of anxiety levels before and after nail polish application

Parameter	Group 1 (Blinded)			Group 2 (Unblinded)		
	Before	After	Δ Change	Before	After	Δ Change
STAI	85.94±12.37	84.12±9.70*	1.82±9.05	89.11±10.80	85.54±8.67*	3.61±8.76
S-Anxiety	42.08±7.03	40.42±5.52	1.70±5.52	44.15±5.68	41.73±5.29	0.20±5.17
T-Anxiety	43.86±6.23	43.80±5.19	2.57±5.27	45.37±5.30	44.12±3.91	1.34±4.48
BAI	24.01±8.60	23.04±6.96	0.99±5.60	24.00±7.56	21.63±7.25*	2.37±4.92

\*significant change (p<0.05) when compared with before nail polish application, Data expressed as mean ± S.D. (n=100). STAI = State-Trait Anxiety Inventory, BAI = Beck Anxiety Inventory.

#### Satisfaction with nail color

The participants rated themselves for satisfaction with their nail color. The results are shown in table 5 that most of them (73% of group 1, 75% of group 2) were satisfied with their nail color. Moreover, half of them (51.00% of group 1, 55.00% of group 2) felt changed in their emotions after the nail polish application.

In addition, the relationship between satisfaction with nail colors and emotional change after nail polish application was determined by the Chi-square test. It was found that there was no relationship between satisfaction with nail colors and emotional changes after nail polish application in both groups (table 6).

**Table 5** Satisfaction on nail color

Category	Group 1 (n=100)	Group 2 (n=100)
Satisfaction on nail color		
Satisfied	73	75
Dissatisfied	27	25
Change of emotional after test		
Changed	51	55
Unchanged	30	20
Uncertain	19	25

**Table 6** The relationship between satisfaction with nail color and emotional change after nail polish application

		Change of problem after nail polish application			Chi-square	Asymp. Sig. (2-sided)
		Changed	Unchanged	Uncertain		
Group 1	Satisfied	47.95%	32.87%	19.18%	1.987	0.370
	Dissatisfied	59.26%	18.52%	22.22%		
Group 2	Satisfied	50.67%	24.00%	25.33%	3.438	0.179
	Dissatisfied	68.00%	8.00%	24.00%		

#### Overall satisfaction before and after the experiment

The participants were asked about their satisfaction before and after the experiment. The results in table 7 found that before nail polish application their satisfaction was at a low level but increase to a medium

level after nail polish application in both groups. It was indicated that the nail polish application helped to improve the emotion of participants and increased their satisfaction with the experiment.

**Table 7** Satisfaction of participants before and after the experiment

Satisfaction	Group 1	Level of satisfaction	Group 2	Level of satisfaction
Before	3.46±1.27	Low	3.34±1.15	Low
After	4.08±1.21	Medium	4.38±0.96	Medium
Δ Change	0.62±0.06	-	1.04±0.19	-

#### Discussion

It has been reported that university students had a great deal created anxiety, especially in their study process. There are many factors that lead to an increase in their anxiety such as difficult subjects, a new environment, and relationship problems [13]. Previous studies have suggested that anxiety disorders are more

prevalent among women than men [14]. The data from the emotional problems were used as criteria for choosing the color of nail polish for participants. It was found that most participants felt depressed. The participants who felt depressed applied their nails with red color because it is the color of energy. The previous studies found that a red color could improve depression

due to the red color is very stimulating, exciting, and amplifying the emotion [5]. The previous studies found that a red room raises a room's energy level, stirs up excitement, stimulates conversation, and creates a strong impression [15]. The participants who felt rough applied their nails with pink color to enhance romance, love, and gentle feeling. The participants who felt complicated applied their nails with a blue color to promote intellectuality and enhance performance on cognitive. The computer color screen studies have shown that blue color could enhance the performance of creative and cognitive [16]. The participants who had a lack of confidence applied their nails with yellow color to increase their confidence. The participants who felt confused applied their nails with a violet color which was associated with authenticity and truth. The participants who felt solitary applied their nails with orange color which is the color that combined the energy of red and the happiness of yellow. It is associated with joy, fun, happy and energetic days. The participants who felt anxious applied their nails with green color to balance and harmonize their mind, body, and emotion. It assists in decision-making and creating a sense of calm. The participants who felt suspicious applied their nails with black color which reported as the color of security, emotional safety and evoke strong emotion. The participants who felt weak applied their nails with a brown color associated with stability [7]. Moreover, when comparing the change values, it was found that the participants in group 1 (blinded) were decreased in depression more than in group 2 (unblinded). This finding was different from the previous study in that unblinded group tended to be biased toward the beneficial effects of the study [17]. It can be illustrated that color is able to improve emotional problems without a bias in the results.

The anxiety level before and after nail polish application were determined by using the questionnaire of STAI and BAI. STAI is used for measuring S-Anxiety (intensity of current feelings) and T-Anxiety (frequency of feelings). It can be concluded that nail colors can reduce the intensity of current feelings and frequency of feeling anxiety of participants in both groups. BAI is a measure of anxiety focused on physiological sensation. The participants in both groups had moderate anxiety [12]. The reduction of BAI scores indicated that the anxiety of participants in both groups was reduced after 1-week application of nail polish.

There was no relationship between satisfaction with nail colors and emotional changes after nail polish application in both groups. It can be concluded that the changes in the emotional problems of the participants might be due to the effect of color which is not related to the satisfaction with the color.

### Conclusion

This study is based on the theory of color therapy. The participants applied nail polish with different colors based on their emotional problems such as depression,

complicated, lack of confidence, roughness, anxiety, weakness, and confusion. The result showed a significant decrease in emotional problems and a decrease in anxiety levels after nail polish application. It could be concluded that colors have an effect on the emotional and psychological of participants. Therefore, the results from this study might be useful for advertising and marketing nail polish in the future.

### Limitation

This study concerning about the emotional data and there were many confounding factors affecting the results. Further studies need to perform the improvement of this work such as selecting the participants that have the same problems, each group having the same number of participants, and prolonging the experimental period to obtain more accurate results.

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