

# **Semiotic Design for Warning Signs to Allergic Reactions Arising from the Use of Hair Care Products**

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**Abstract** — Hair care products are generally utilised for medical purposes such as personal hygiene, skin improvement, anti-aging conditions and self-confidence. Nevertheless, some of the hair care products containing prohibited substances could cause adverse effect to the consumers. Normally, consumers are unaware of the substances used in hair care products due to lack of information and awareness. Currently the design on hair care products does not indicate any warning signs or warning symbols that informs of side effects or allergies. Semiotic designs evaluate the process by which signs and symbols come to have meaning. The concern on how signs are developed and interpreted based on scientific symptoms is the main focus of this research. The study on various scientific symptoms reactions caused by the hair care products were then translated to visual signs. Semiotic designs are one of the important components in designing symbols and icons, thus helping consumers understand the meaning of each symptoms through visual signs. A series of pictograms were created based on the six categories of allergic reactions. Feedbacks from the sampling/users were utilised to identify the effectiveness of warning signs.

**Keywords** - Hair care product; Allergic reactions; Warning sign; Semiotic design; Labelling

## **1. Introduction**

In the globalization era, our country continues to improve in terms of technology, science, society, economy, entertainment and also education. For many years, especially in the second half of the twentieth century, scientists focused on the properties of hair to develop products which alters the health, feel, shine, colour and softness. The purpose of the hair care products such as shampoos and conditioners are for the maintenance and grooming process. They also rid the hair of skin oils, repair hair damage and make the hair easier to comb, among others. In the modern era, with the advances of science, chemistry and technology have made breakthroughs in creating a complex formula of cleansing agents to remove dirt and grease from hair and scalp. According to Lan Johnston (2017) he had mentioned that everyday items like shampoo that contain the chemicals were linked with cancer in the human body. Based on Skalen (2010), it was stated that six reason why consumers use the Hair Care product. Their purposes are for medical, personal hygiene, improving skin, anti-aging and self-confidence improvement. Based on Matthew Giles (2016) in the journal of a brief introduction to hair and science of hair care products, the sale of hair care products in Asian increased from 2008 until 2016 and will increase from 2017 to 2018.

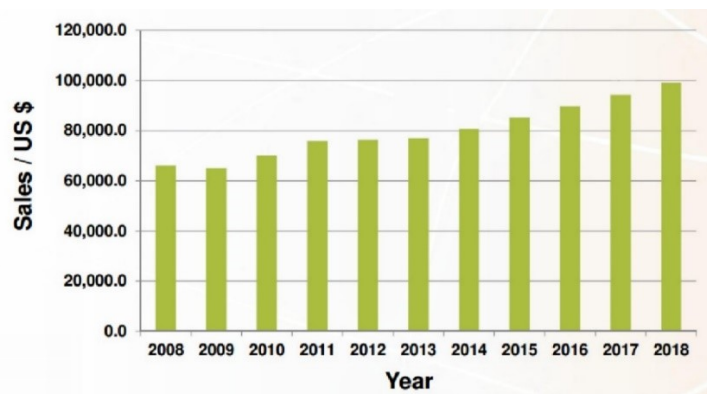


Figure 1: Hair care products total sales in Asian from Year 2008 until 2016 forecast sales for year 2017 to 2018

In the same journal, Matthew Giles also stated sales of hair care products by category, which is 2-in-1 products, colorants, conditioners, hair loss treatments, perms and relaxants, salon hair care, shampoos and styling agents. Shampoos are the main product that get the highest demand, followed by conditioners.

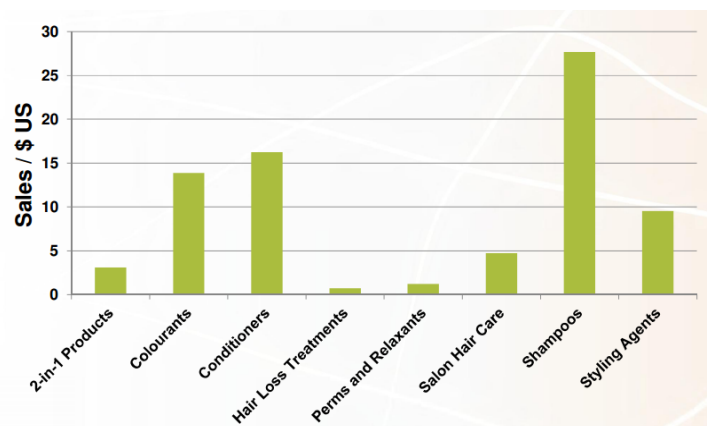


Figure 2: Hair care products Total sales by category from Year 2008 until 2016

In using Hair Care product, most of the consumers are not aware of the content or chemical used in the products. Normally, consumers are not aware of the content of the ingredients in Hair Care product and do not know about the specific ingredients of the Hair Care products. As cited by Norudin (2010), commonly consumers will take one minute to select a product. Thus, based on this statement indirectly they do not have the knowledge and normally they would just select the product without reading the content label. In this case, people do not understand the consequences of allergic reactions. According to Stanley (2009) with study of chemical sensitivities was reported that most of the people within age 20-50 years may have the chemical allergies that reacts to the human body. Most people have allergies with chemical ingredients such as Isopropyl Alcohol and its effect to human body can cause red skin, itching and cracked skin. Based on the past research by Health and Safety Department, there is no proper warning sign and symbol design on the hair care products. There is no specific symbol that represents any specific allergy. There are several advantages and benefits of sign and symbol in intercultural situations. There are easy and attractive presentation, quick expression message and reducing time (The Business Communication, 2015). Refer to semiotic terminology, it is formed from words, images, sounds, gestures and objects (Chandler, 2007). Two theories of signs have existed from ancient times onwards; Swiss linguist Ferdinand de Saussure (1857-1913) and American philosopher Charles Sanders Peirce (1839-1914). In this study, the researcher will identify and provide examples of reactions to the consumer and the types of chemical or ingredients that causes reactions or allergy reaction to the consumer. The entire sample of allergies that gives reaction and symptoms to consumer will then be analysed. Each sample of allergies that gives reaction and symptoms to consumers will then transform to visual signs, which translates and transforms the symptoms or allergies. This research will evaluate the interpretation and meaning of symptoms that could help consumer to understand and give the right information and early notification to the consumer on the ingredients, which may cause reactions or allergy to consumer. Understanding the types of allergy, reaction and symptom and then translated it to different types of visual signs that represent the various symptoms and categorise it into different levels of illnesses or severity of illnesses (minor, moderate, major and extreme) Centers for Medicare and Medicaid Services, 2006)

In another study with different perspective, Ming Yang and Fan Hsu (2015) from the journal of International Education Studies define the semiotic design as one of the important mediums in the education and learning process. It involves selecting and arranging images on a graphic medium to convey the information to people (Barnar, 2013). In a different context, fact shows that acceptance and response from the public is one of the major issues by creating the warning sign or using the visual image as a material for conveying the information.

### 1.1. Problem Statement

To date, most of the cosmetic products available contain scheduled poisons that are not even allowed to be used, as stated by the Health Ministry's Pharmaceutical in March 2017. Additionally, it has been found that 23 over 88 persons have reported the reactions they had with chemical allergic symptoms per day when using hair care products (National Allergy Research Centre, 2007). Indirectly, consumers are concerned on the chemicals that show allergic reaction symptoms. Moreover, based on observation and preliminary study, it was indicated that 66.7% of the hair care product users are not aware on the ingredients causing allergy reactions and symptoms to their skin and health. The current labelling on product does not display any types of visual signs or images representing the allergy reactions and symptoms or warning signs on the severity of illnesses (minor, moderate, major and extreme) as well as symbols on various allergy symptoms that react by any types of chemicals or ingredients used in the hair care products. Analysing the samples of popular hair care products with the graphic symbols or indication of warning signs or highlighting the chemicals reaction symptoms might be the solution for the aforementioned problem. Fred (1996) indicated several products that are not showing or describing any warning that represents the harm of using the overdose hair care product to those with allergy on certain chemicals. There are various chemicals that could cause allergy to consumers. The most commons chemicals used for hair chemical are Isopropyl Alcohol, Mineral Oil, Polyethylene Glycol, Propylene Glycol, Sodium Lauryl Sulphate, Chlorine, Diethanolamine, Colour Pigments, Fragrance and Imidazolidinyl Urea. The overdose or intake of these chemicals will give reactive symptoms such as scaly patches, red skin, blister, itching, cracked skin and swelling on eyes. In short term, the chemicals may not show any reaction to the users; instead, they demonstrate some allergy symptoms to the users such as hair fall, skin, blister and itching. Meanwhile, their long-term reactions include Cancer (Martin Bagot, 2015). Therefore, this study attempts at identifying the chemicals that are able to cause reactions of allergy. The symptomatic reactions obtained will then be translated to visual signs and further converted into warning signs.

### 1.2. Scope and limitations of research

The scope of this research is to focus on designing the signs and symbols that cause allergy reactions and show symptoms due to the usage of Hair Care products. Sample of the products collected were based on high sale volume in Malaysia. Selected item of hair care products that can cause allergy reactions to consumer based on the ingredients that were declared as dangerous item by Ministry of Health, Malaysia and other countries. The sample of scientific evidence that show graphic of images on the allergy or symptoms that are caused by the hair care products sold in Malaysia. Distance is the most limitation to conduct this study in which the researcher needed to link with the government sector National Pharmaceutical Regulatory Agency (NPRA) in order to obtain further information about Hair Care products. The investigation will involve the population in range of age from 20 years old and above including both male and female.

### 1.3. Aim of research

The aim of this research is to help and educate consumers to exercise more cautious when purchasing a hair care product. Awareness on the chemical used in the hair care product that could give allergy reaction that could potentially harm the consumer. This research also aims to design warning sign symbols that indicates symptoms of allergy that is caused by hair care products.

## 2. Literature Review

### 2.1.1 Type of sign

The creation of symbol is one of the methods in communicating information and is often interpreted in different ways. According to Martin B. Curry (1996), designers should design symbols as easy as possible to be understood. Based on M.C. Dougall (1996), it was identified that the characteristics of symbol can give impact to consumers. There are several characteristics of symbol highlighted by M.C. Dougall. The first is concreteness and visual complexity. Visual complexity concerns more on visual pictures including places familiar with the real

world. On the other hand, concrete symbols refer to objects that can be recognised by sense. The second characteristic is Meaningfulness. This indicates that symbols should be created for usability and functions. The third is familiarity and similarity as they reflect the frequency with symbols encountered.

### 2.1.2 Warning sign

Commonly, warning sign is a type of traffic sign and can be found on the road. Warning signs are created based on special attention to give alertness to people. There are several types of warning sign used around the world such as (1) diamond shaped with yellow background and black border, (2) triangular with red border and white background, (3) triangular with red border and yellow background, (4) triangular with black border and yellow background. In Sweden, Serbia, Bosnia and Herzeqovina, Greece, Finland, Iceland, the Republic of Macedonia and Poland use warning sign in diamond shaped with yellow background and black border or triangular with black border and yellow background. Meanwhile, in Republic of China except Macau and Hong Kong, they use warning sign in triangular with red border and white background or triangular with red border and yellow background.

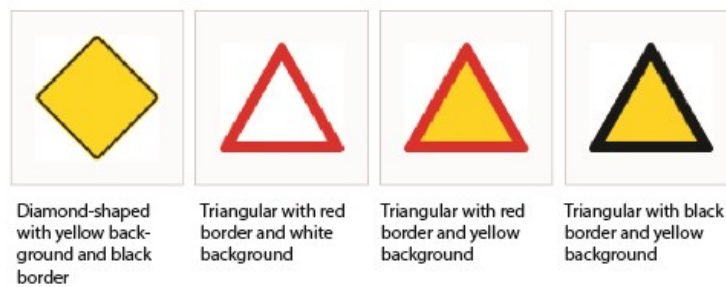


Figure 3: Examples of warning sign

### 2.1.3 Prohibition sign

Prohibition signs are created according to certain behaviours or actions since they would result in a potential risk of personal injury. Prohibition signs can be recognised by red ring and diagonal bar with black symbol on white background.



Figure 4: Examples of prohibition sign

### 2.1.4 Mandatory action sign

Generally, the mandatory sign is generated for an instruction to be carried out by the users. It usually uses white symbols on a blue background with white border or black symbols on a white background with red border. Mandatory sign is commonly used for traffic or construction in a specific area.

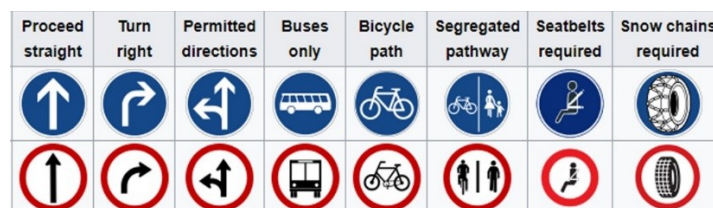


Figure 5: Examples of mandatory action sign

### 2.1.4.1 Safe condition sign

Safe condition sign is created representing the actions that need to take place in certain situations. It also gives information on emergency exits, first aid and rescue facilities. This type of signs contains a white pictogram on a green background with rectangle shape.



Figure 6: Examples of safe condition sign

According to Health and Safety Executive Guidance (2009), there is an indication of the specific colours and meaning based on the four-safety sign. There are red, yellow or amber, blue and green. The guidance aimed to help and give intention to people instead of verbal communication.

## 3. Research Methodology

Research design is fundamental for researchers in order to fulfil the definitive to the amount the facts present permits to them in conformity to answer the initial query as much simply as like viable (Craswell, 2000). The research design chosen for this study is a correlation research under the experimental research. The correlation research is the near appropriate lookup design in imitation of the researchers due to the fact such may offers partial ideas on whether twins or greater things are associated in imitation of each mean yet into effect, where they section or hold among general, yet how much properly an elaborate outcome intention keep expected but some or extra part regarding information (Salkind, 2009). The type of correlation research that is generally used by researchers is survey and questionnaire. Correlation study can be described as linear relationship between two or more variable without any hint of attributing that effect of one variable on another.

In the current research, the descriptive analysis is carried out for specific reasons whereby (1) to investigate the type of allergy symptoms reaction cause by Hair Care products and (2) to identify the best graphic representation that can explain the type of allergy on chemical reaction caused by the hair care products. Last but not least, the descriptive analysis conducted to develop a warning sign and symbol design in educating the consumers towards the allergy symptoms reaction. 150 set questionnaires were distributed to all respondents and 130 was returned and 120 was usable.

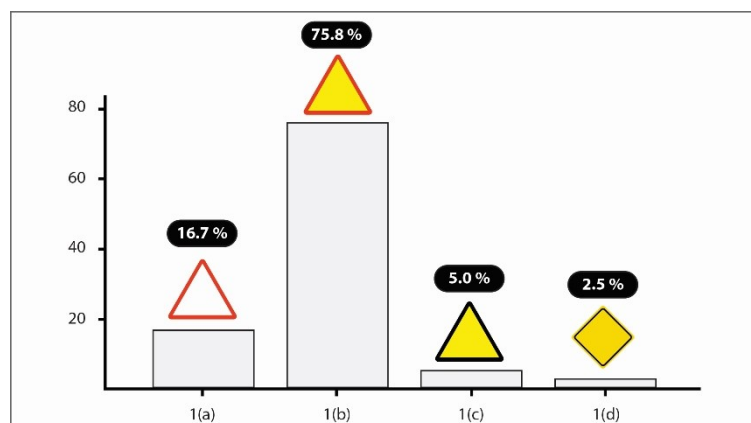


Figure 7: Symbol that give effective warning sign

Figure 7 show majority of the respondents choose type “1(b)” with a total of respondents 91 (75.8%) while the minority of respondents choose type “1(d)” with only 3 respondents at 2.5%. This finding relatively suggests that most of respondents were familiar with type “1(b)”. On the other hand, it can be assumed that most respondents participating in this study were among the young and middle-aged generation who are familiar with the current news and many hair care products. By referring Figure 8 pictorial symbol that describes an allergic reactions as specific category illustrates the pictorial symbol that respondents choose involved in this study. The majority respondents were identified they are familiar with pictorial symbol “b2” with a total of 14 (11.7%), and the minority of respondents choose pictorial symbol “d1” by a total of 3 (2.5%). For the pictorial symbol “a1, a3,

c4, e2, f1 and f2” it’s no respondents are familiar with the pictorial symbol. On the other hand, it can be seen that most respondents participating in this study were also of those who are knows about each pictorial symbol that describes allergic reactions.

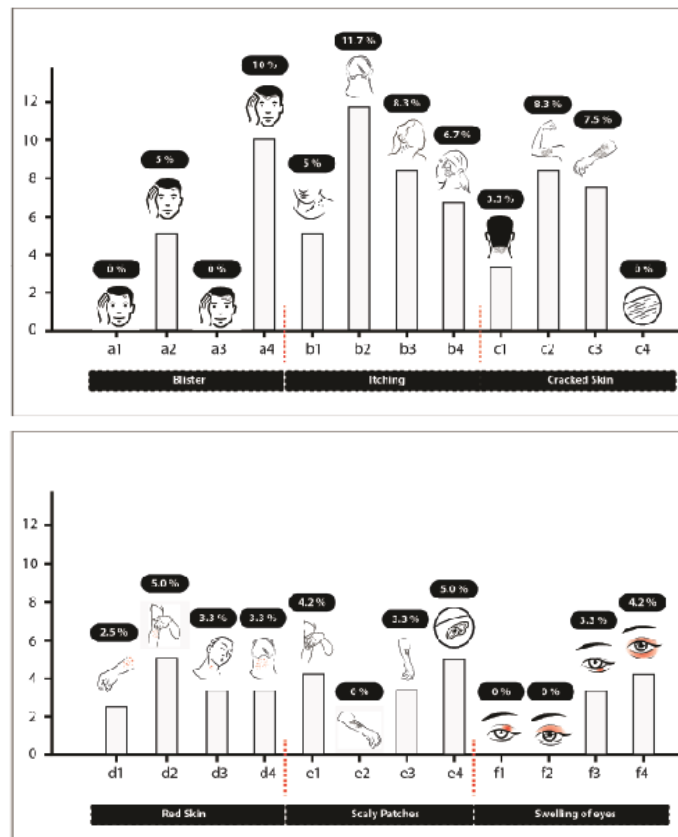


Figure 8: Pictorial symbol for allergic reactions based on category

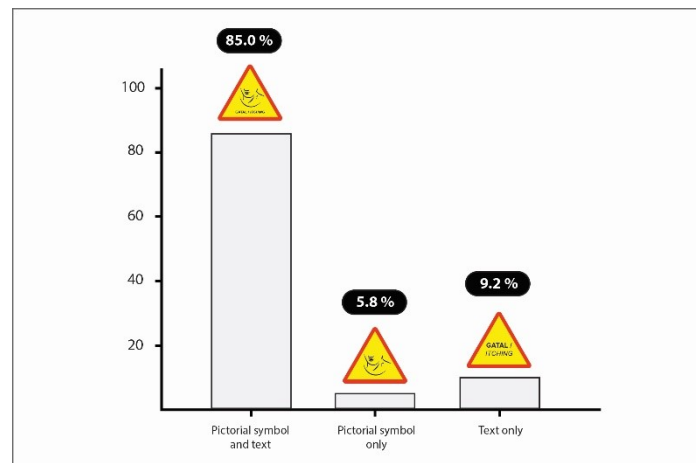


Figure 9: Symbol that give more dominant to show warning message

Based on Figure 9 above presents the respondents are familiar with symbol warning information in the combination of pictorial symbol and text with total 102 respondents (85.0%). The minority are from symbol warning information in pictorial symbols only with total only 7 respondents (5.8%).

#### **4. Conclusion**

As a conclusion, warning symbols will help consumers to be more aware, especially for those who do not know the ingredients of hair care products. Adoption of pictorial symbol in warning sign is one of the alternatives to educate consumers on allergic reactions or adverse effects by using hair care products that contain chemical ingredients

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