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**A Design Proposal to Prevent the Misuse and Abuse of Over-the-Counter
Pharmaceuticals in Convenience Stores**

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ABSTRACT

Over-the-counter pharmaceuticals sold in convenience stores observe the pharmaceutical laws and currently provide information on the pharmaceuticals that are accurate and easy to understand on its containers, packaging, or attached materials for the prevention of drug misuse. The limited space of the packaging, however, makes the information difficult to read and consequently, consumers have had difficulty in purchasing the products. This research conducted an analysis of 8 packages of pill-type drugs and conducted a survey and interviews targeting 10 foreigners and 20 Korean consumers to analyze the user consciousness. This study presented some ideas for improving the design by using English expressions and pictograms, which both domestic and foreign consumers can easily and quickly understand, and by placing the information on the symptoms, dosage and age information on the edge of each package so that the type of drugs will be easily discernible. Through such measures, drug misuse or abuse will be minimized and customers will find it more convenient when purchasing pharmaceuticals.

Keywords: medicine, package design, package information

Introduction

24-hour convenience stores have sold safe reserved medical supplies from November 15, 2012: KFDA reported an increase of approximately 3-5% per year. But the packages of the safe reserved medical supplies are a small area not enough to contain much information without the expert's explanation, Thus the packages are poor in readability and it is difficult to learn the information due to the small sizes of the letters: especially the elderly have difficulty in understanding the content. This may be problematic in allowing consumers to prevent abuse use of medicines. Therefore, the safe reserved medicine is required, through which may pass the appropriate information to consumers. This study attempted to propose the design improvements for consumers to choose the product information on the safe reserved medicine package without a pharmacist.

This study was conducted of 8 items in a tablet form among the 13 safe reserved items of medical supplies that are sold at 24-hour convenience stores. A theoretical review was made on safe reserved medical supplies and package design. Subsequently, an analysis and an interview on the status of domestic safe researched medical supplies were conducted to perform the research on users' consciousness was conducted. Based on this, this study proposed design improvements.

Analysis of the Status of Safe Reserved Medical Supplies

Domestic Drug Labeling Regulations

Korea Food and Drug Administration (FDA) announced <The Guidelines for OTC Packing, Attachments, and Labeling> depending on the needs of the Pharmaceutical Affairs Law, etc. The guidelines contained how to write information (related to the Paragraph 1 of the Article 6) on outer containers or packages. These guidelines defined the details on commons, efficacy, effectiveness, usage and capacity, precautions, writing formats (example) as follows:

Table 1

How to write information on outer containers or packages (related to the Paragraph 1 of the Article

ow to write information on outer containers or packages	
1. Commons	<p>a. For pediatric medicines, only the approval requirements for children shall be summarized and described.</p> <p>b. The efficacy, effect, usage. and capacity shall be written in the visible surface.</p> <p>c. In the outer container or package where information have been summarized and described, the following contents and side effects shall be reported in the text box: the Korea Drug Management Service (phone number) shall be written.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>This content is a summary of the approvals for consumers to make a safe choice. See the attached document (or 'description of the packaging requirements') before use (taking).</p> </div> <p>d. In the upper right of the attachment, the bar code shall be printed.</p> <p>e. Other details such as font size, line spacing, etc. shall follow the relevant provisions.</p>
2. Efficacies, Effects	<p>Efficacies and effects shall be summarized and written so that consumers can select general medicines when choosing them.</p>
3. Usage· Capacity	<p>a. Solid pharmaceutical compositions taken according to the drug approval or complaint shall be written into an amount of grain per unit dosage, in other words, 'one pill once, 0 pills dosage to the maximum per day'</p> <p>b. Fort the usage for children less than 2 years, the use shall be written in consultation with the doctor, acupuncturist, dentist, pharmacist, or oriental herbal pharmacist depending on the nature of each formulation.</p>

4. Precautions

a. A summary and description shall be done in the following order, the title and contents can be written integrated and separated.

1. Warning
2. The following persons shall not take.
3. While taking, the following drugs shall not be taken/While taking, the following actions shall not bet taken/
4. For the following persons, the phase the ‘consultation with the doctor, acupuncturist, dentist, pharmacist, or oriental herbal pharmacist shall be written.’
5. In the following cases after taking the medicine, the taking shall be immediately stopped. According to the nature of each formation, the consultation with the dentist, pharmacist, or pharmacist shall be written.

b. The contents under the title shall be summarized and described focused on the matters that consumers must know.

Ex.) Acetaminophen formulation

Hypersensitivity to acetaminophen	Peptic ulcer	Severe blood dyscrasia
Severe liver disorder	Severe kidney disorder	Severe cardiovascular function decline

5. Writing Format

a. For the background and text color, the color to raise readability shall be used. In principle, a white color shall be used as the background, For letters, a black color shall be given.

b. Between an item and an item, a thick line is used to distinguish it. The content between an item shall be distinguished using a thin line. For the colors for lines, the lines to raise readability shall be selected.

3. For the warning item, a bold line shall be used. For the background, a yellow color shall be used.

Status the Status of Safe Reserved Medicines

In the user manual (attachment) or in the back of the packing, the contents needed for safety are written. The package contents are a summary of the approvals needed for safety, such as ingredient, efficacies, effectiveness, usage, capacity, and precautions. The items mentioned of the attached document or package should be checked. The safe reserved medicines started being sold in the 24-hour convenience stores from November, 2012.

The Department of Health and Human Services finally approved antipyretic analgesics, cold, chemical, fasteners, etc. Of 13 items of safe reserved medicines, 8 items are shown in <Table 2>.





Table 2
8 Items of Safe Reserved Medicines in an Pill Form

8 Items of Tylenol tablet Safe Reserved Medicines in an Pill Form	
Paracetamol (3 types)	Tylenol tablet 500mg(8)
	Tylenol tablet 160mg(8)

	Tylenol tablet for children 80mg(10)
Cold Medicine (1 type)	Panpirin tablets (3)
Peptic (4 tyess)	Bearse tablets (3)
	Dr. Bearse tablets (3)
	Festal tablets (6)
	Festal tables (6)

Table 4 shows the summary of the results of the implementation on the 8 items based on the Paragraph 1 of the Article 6 of the guidelines contained how to write information on outer containers or packages.

Table 3
Analysis of the status of safe reserved medicines according to how to write

Safe reserved medicines	Effic ts, Effi cien cy	Ussa ge and Volu me	Precautions					Attac hme nt	Bra iille	Writing format			Refere nce · Rema rks
			1	2	3	4	5			a	b	c	
P A R A C E M O L	Tyle nol tablet 500 mg (8)		•	•	•	•	•	•	•	•	•	•	
	Tyle nol tablet 160 mg (8)		•	•	•	•	•	•	•	•	•	•	
	Tyle nol tablet for child ren 80mg (10)		•	•	•	•	•	•	•	•	•	•	Image used
Col d me dici ne	Panpi rin tablet (3)		•	•	•	•	•	•	•	•	•	•	Illustrate d picture used

P E C T I C	Bear se tablet (3)		•	•	•	•	•	•	•	•	
	Dr Beasr se tablet (3)		•	•	•	•	•	•	•	•	
	Festal Gold tablet (6)		•	•	•	•	•	•	•	•	Pictogra m and English used
	Festal Plus tables (6)		•	•	•	•	•	•	•	•	Pictogra m and English used

Survey of User’s Consciousness

A survey of the total of 30 including 10 Koreans and 20 foreigners was conducted who have used safe researched medicines. The sex ratio was 63.3% men and 36.7% women. The main age group was investigated 20s. The research of convenience shopping experiences found that they purchase the medicines and are unaware whether medical supplies are sold in convenience stores. The average total number of purchases is 4.5 times in Koreans and 1.1 times in foreigners. They purchased the safe reserved medicines once every three months and 1~2 times year. For medical supplies, 83.3% of responses purchased them in pharmacies, usually antipyretic analgesics and cold medicines.

For whether they subscribe to the information on the package, 56.7% read it and 70% of consumers did not read it. They read efficiencies and effects first. In understanding the information on the package, "to some extent understand" was 66.6% and "Do not understand" was 16.7%: 4 of 5 who have selected were all foreigners. In the question “Can you find the items side effects and precautions for use on the package?” 53.3% answered “I cannot find them easily.” In the question “Have you ever purchased medicines after making a wrong judgement on the capacity, usage, efficiency, and effectiveness?” 88.9% said "I did not ever misjudged." For 11% who answered “I made a wrong judgement.” they said they did not understand the information because they did not know Hangul. In case of Koreans, they purchased the medicines with the medical supplies different from their symptom. In the question “Are willing to pay for future purchases the medical supplies at 86.2% was higher repurchase doctor. 86.2% expressed a higher intention of purchases as 86.2% answered that they would purchase the medical supplies at convenient stores.

For the details on uncomfortable things when purchasing at convenience stores. Koreans and foreigner answered in common “I purchase medical supplies at my own intention because of the absence of knowledge by the staff at convenience stores. Other comments were “types of drugs are limited” and “the package design is similar, so the package has many letters and it is difficult to read the information at a glance,” which occupied 40%. For

foreigners, they answered that they do not drug information and said they purchase the medical supplies after searching for the information on the internet.

Package Design Improvements

A survey showed the information of the safe reserved package is smaller on the font size and is less noticeable. For foreigners, they said it was difficult to understand the package in Korean. However, due to the regulation on the writing of containers and packages of pharmaceutical products, it was difficult in improving the design of safe reserved medical supplies. Therefore, this study attempted to propose how to distinguish medical supplies at the first glance by applying the pictogram and English notation that can be quickly and easily understood. In addition, the pictogram of the pharmaceutical sources was utilized. Additionally, a total of three kinds of the symptom, capacity, and age were applied and placed on the same position of the packages of the safe reserved medicines so that consumers can be convenient in their purchase.



Figure 1: Design Improvements(1)



Figure 2: Design Improvements(2)

Conclusion

The results of a survey of 10 foreign and 20 Korean customers on users' consciousness found that foreigners did not understand what the medicine was because of no English notation. In details on uncomfortable things during purchase at convenience stores, Koreans and foreigners had to purchase the medical supplies at their own intention due to the absence of the knowledge of medicines by staffs of convenience stores, In addition to those, the letters of the items are less noticeable. Three types of Tylenol, and two types of Festal tablets, and Bears tablets are similar in their packages and it is hard to distinguish the difference.

However, there are limitations in improving the package information of the safe reserved medicines due to the regulations of the font size, line spacing, and description method in the containers and packages of medical supplies and the items for attached documents. Therefore, the ease of consumers was raised by applying the pictogram that consumers can quickly and easily understand. It was aimed to be able to distinguish what medicine is at a glance by allowing the pictogram to be located on the edge of each package.

In the future, more studies tries to plan to process the verification of consumers and professionals and to study the applicability through improvements to the design proposed in this study. Thus, consumers are expected reduce their errors in purchasing safe reserved medical supplies.

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