

A comparative study to evaluate patients interpretation of U.S.P and locally designed pharmaceutical pictograms

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The objective of the study was to evaluate patients interpretation of U.S.P and locally reinforced pharmaceutical pictograms. A set of 91 pharmaceutical pictograms are there in the United States Pharmacopoeia Dispensing Information. Out of these, 8 pharmaceutical pictograms were randomly selected illustrating :

- Place drops in the ear
- Do not store near heat or in sunlight
- Do not drink alcohol while taking medicine
- Do not take with meals
- Take four times a day
- Call your doctor
- Do not refrigerate
- Do not use additional salt

For the present study each pictogram was reinforced with local information and redesigned. A set of 16 pictograms were shown to the patients of age group 25 - 55 yrs. at Shri Mahant Indresh Hospital , Dehradun and, their interpretations were recorded respectively. The percentage of correct interpretations of USP designed pictograms was 8% and that of locally designed pictograms was 72%. (Table 1a & 1b). The study indicates a need for reinforcing these pictograms according to the local customs and culture. In order to judiciously utilize the pharmaceutical pictograms in clinical practice, care should be taken by health care providers to avoid any chances of misinterpretation of the pictograms. The USP designed pictograms reflect and speak western culture which may be read incorrectly by local population.

Keywords: pictograms, patients, U.S.P-DI, interpretations, reinforcing.

Introduction :

Pharmaceutical pictograms can be valuable in reinforcing information given to patients by other means; but they need to be culture specific and carefully explained. It is not only recommended for the illiterate society but also for the literate ones as it can serve as one of the easiest and rampant means of patient information material.¹

A set of 91 standard pharmaceutical pictograms appears in the United States Pharmacopoeia Dispensing Information (USP - DI), illustrating various medicine taking instructions. However, these pictograms were developed for use in a sophisticated, technologically advanced society and they reflect the westernized based American culture. However, each individual's perception and interpretation of visual information are influenced by his environment and his cultural base, values and communication.³

Actually, providing pictorial information comes under visual literacy, a skill which is frequently neglected in the formal curriculum and is usually acquired through constant exposure to pictorial material and to the media also. If to a young child these pictures are repeatedly explained then these can be acquisition of visual literacy at an early stage but in our country for majority of the people

especially the backward society books are the rare commodities resulting in reduced ability to interpret visual media. ²

Non - compliance is also one of the major problem for the people who are unable to read and understand written medication instructions. This problem also exists in the literate society especially elderly patients suffering from dementia, they generally forget the verbal instructions given by the doctor and the young ones who are not bothered of what is written which is in very small font on the label due to their busy schedule. All these problems can be overcome by providing pictorial information on the medicines which are easily readable and understandable.⁴

Pictograms are the means for conveying medicine instructions and various studies have been conducted related to it. E.g. A study was conducted in Uttaranchal (Dehradun) to evaluate the influence of education on the interpretation of pharmaceutical pictograms for communicating instructions for taking medicine. In this they have used, USP-DI pictograms and conducted counseling.

In continuation to above work, a study was planned to evaluate patient interpretation by introducing the locally

designed pharmaceutical pictograms conveying the same instructions as per USP pictograms.

Hence, the objective of the present study were to investigate the influence of collaboration with the target culture on the interpretation of pharmaceutical pictograms by comparing the interpretation of the USP - DI pictograms and locally designed pictograms by the author.²

Material & Methods:

Questionnaire Development:

To assess the knowledge, attitude and the patients interpretation towards the pharmaceutical pictograms, a 9 item questionnaire was developed. The questionnaire includes questions regarding the demographic details and the patients interpretation of USP and locally designed pictograms.

Enrollment of subjects:

A visit was conducted at the study sites and after full verbal explanation about the study, interested patients were enrolled and their interpretations/responses regarding the pictograms were recorded. Patients under the age group of 25-55 yrs. were included in the study. The total study duration was 1 month.

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Study sites: - Shri Mahant Indiresch Hospital, Dehradun, Uttarakhand. (A 400 bedded Multi-Speciality Teaching Hospital)

Preparation of pictograms sets ²:

From the available 91 USP pictograms 8 pictograms were selected randomly. The locally modified version of these 8 pictograms was generated. A total of 16 pictograms (2 sets of 8) were in hand for evaluation. They were printed in black/colored ink on a white background and were numbered.

Study design:

Interviews were conducted personally with the aid of the prepared questionnaire-"Pictopretation". The interview of the patient was done in an attempt to put the respondents at ease and to make the process as non-threatening as possible by emphasizing that this was not a test of the participants 'mental ability and cleverness', but a test of the pictograms to see how good each pictogram was at communicating its meaning. Selected demographic information was collected (name, age, gender, occupation, monthly income, food habits, educational level). There was no time limit for their ability to interpret pictograms. Respondents who can read as well as those who can't were enrolled. The interviewees were then shown all 16 pictograms, one at a time, in random order with no previous explanation of the meaning of individual symbols. They were informed that the same answer could be given more than once. The respondent was asked to give his or her interpretation of each image and their responses and interpretations were then recorded.

Thereafter, each locally reinforced pictogram was again shown to the interviewee and the correct meaning was explained.

Interviewees gave their opinion on pictograms, their thoughts about their concepts, their likings and disliking regarding the symbols at the end of each interview.

Result:

I. Demographic results:

In total 100 respondents were interviewed (Table 1). The majority (60%) were males and all the respondents were among the age group of 25-55 year.

Among them, 56% were under the age group of 25-35 yrs.; 19% under 35-45 yrs. Age group and 25% under the age group of 45-55 yrs.

There were no significant differences in the standard of education among the respondents. Among them 20% had no education of understanding ; 18% had done their education upto 5-7 class; 21% studied upto 7-10 class; 17% upto 10-12 class and

23% of them were graduates.

Demographic	Category	Percentage (%)
GENDER	Male	60
	Female	40
AGE (in year)	25-35	56
	35-45	19
	45-55	25
EDUCATION	No Education	20
	Class 5 to Class 7	18
	Class 8 to Class 10	21
	Class 11 to Class 12	18
	Graduate	23

II. General results from all 16 pictograms:

Data given by the patients (respondents) were analyzed and it was found that the percentage of respondents giving the correct interpretation of individual pictograms ranged from 0% to 84%. (Table 2a & 2b).

The locally designed pictograms generally yielded a higher percentage of correct interpretations as compared to USP designed pictograms. The local images were preferred over the USP pictograms.

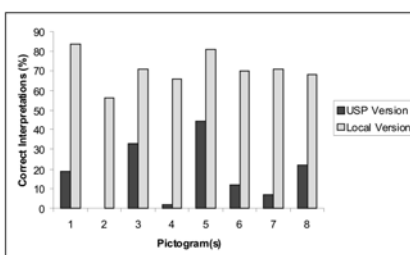


Fig: Comparison between USP and Locally designed Pictograms

Pictogram(s)	Correct Interpretation (%)	
	USP Version	Local Version
1	19	84
2	0	56
3	35	66
5	44	81
6	12	70
7	7	71
8	22	68

Table 1: Comparison between USP and Locally designed Pictograms

Discussion:

The importance of designing local pharmaceutical pictograms was overwhelmingly apparent from the results of this study. All the local pictograms were well interpreted as compared to the USP ones with the improvements ranging from a minimal 36% to a dramatic 65%.

Our results indicated that the similar problems would be existing in different places and countries regarding the interpretation of USP-pictograms. No, obvious differences in acceptance or rejection of certain graphic images or styles were identified between the patients.

Our target population were the patients of the age group 25-55 years. and all were having different beliefs about health, cultural values, eating habits and lifestyles from typical western type population.

When presented the USP pictograms the majority of the people found it difficult to identify the central focus of the visual due to their random eye movements and their lack of attention to detail on the main features. Wherever possible, we attempted to simplify the images and to provide a clear focus on the main illustrated concept. The logic and experience expressed by the visual are often mismatched, making it more difficult to grasp the meaning of the image. This was evident in the pictograms describing instructions for not taking additional salt where it was apparent that this was a foreign concept to many respondents.

Also in the pictogram illustrating for do not store near heat or in sunlight was not capable of encoding the message quickly as a result respondents lose interest.⁶ Despite close collaboration with the target population during the design process, it was clearly evident that pictograms however designed simpler, have the potential to be misinterpreted that can result in unsafe medicine taking practices with potentially serious effects on health outcomes.









Two factors should be considered when assessing the results from this project and applying them into practice. First, the patients were shown images which were totally unfamiliar and all of them had received no prior explanation of the meaning of the pictogram. Their ultimate value in practice depends largely on their appropriate use by the health-care professionals who must offer the appropriate meaning and verbal explanation of the pictogram to the patient.^{2,7}

Second, respondents were shown a total of 16 pictograms, a process that requires a sustained degree of concentration and was tiring and confusing.

In practice, a maximum of 7-8 pictograms would be displayed and explained. Research has shown that medicine labels and patient information incorporating pictograms are preferred over the text-only versions. Hence, pictorial labels could serve as a valuable aid to expedite the communication process.


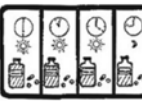






To optimize the value of pictograms in practice, it is essential that health care providers must aware of the potential for misinterpretations and incorrect meanings to the most commonly used pictures which were developed for use in a technologically advanced society and they reflect the American culture. So, there is a need for reinforcing these pictograms according to the epidemiological studies.

Table 2(a): Number (%) of respondents (n=100) who correctly interpreted the symbols and selected examples of misinterpretations

Instruction	USP Version	Misinterpretations	Local versions	Misinterpretations
1. Place drops in the year	I = 19 % 	<ul style="list-style-type: none"> Put medicine in the mouth /eye/nose/vagina Medicine for the lungs/headache An injection A shoe/ upper leg / head /eye / stomach / womb / vagina Person has a sore on his lips. 	 I = 84%	<ul style="list-style-type: none"> Put medicine in the eye The man put medicine into his nose as he has a sore ear.
2. Do not store near heat or in sunlight	I = 0 % 	<ul style="list-style-type: none"> Take half the medicine Take /do not take when there are clouds Do not smoke when taking medicine Do not take medicine and sit near a fire. Do not drink water/milk /coffee jar A rubbish bin/ empty glass. 	 I = 56 %	<ul style="list-style-type: none"> Do not take medicine and sit near the fire /in the sun Put the tablets next to the fire. Medicine will burn you /make your warm.
3. Do not take with meals	I = 35 % 	<ul style="list-style-type: none"> Take one tablet with three glasses of water. Take/do not take with water/milk/milk shake Drink the milk, water or juice. Take medicine before you drink alcohol. 	 I = 71 %	<ul style="list-style-type: none"> Take/do not take medicine with milk /any liquids. medicine for person who drinks a lot of alcohol Drink alcohol first then take medicine.
4. Do not take with meals	I = 2 % 	<ul style="list-style-type: none"> Take the medicine with food Do not take medicine if you have not eaten. Take medicine before eating meal/after drinking tea. Cut the tablet with the knife and fork / 'these things'. 	 I=66%	<ul style="list-style-type: none"> Take tablets after eating food Eat a lot of food before taking tablets. Do not take the tablets.

i = percentage of correct interpretations

Table 2(b): Number (%) of respondents (n=100) who correctly interpreted the symbols and selected examples of misinterpretations

Instruction	USP Version	Misinterpretations	Local versions	Misinterpretations
1. Take four times a day.	 I = 44 %	<ul style="list-style-type: none"> Take the medicines three times a day/only during the day/not in bright sun Take the tablets when you see the sun and the moon. The sun sets and the sun rises and you take medicine. 	 I = 84%	<ul style="list-style-type: none"> Four medicine bottles and four watches. Take the tablets in the day and at night. Take the tablets 3 times a day.
2. Call your doctor	 I = 12 %	<ul style="list-style-type: none"> No idea Talking to a friend Fireman / helmet 	 I = 70 %	<ul style="list-style-type: none"> No idea Do Not use phone with doctor Blood pressure measuring machine
3. Do not use additional salt	 I = 7 %	<ul style="list-style-type: none"> No idea Coffee jar/ ketchup bottle Box/ bottle/ fruit Juice 	 I = 71 %	<ul style="list-style-type: none"> No Idea Wheat flour bag
4. Do not refrigerate	 I = 22 %	<ul style="list-style-type: none"> No idea Do not keep medicines in cupboard Safe/ cupboard, etc. 	 I = 68 %	<ul style="list-style-type: none"> Take tablets after eating food Put medicines in the cupboard

i = percentage of correct interpretations

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Hon. Gen. Secretary, IPA