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## Comparative Analysis of Understanding of Pictograms among Pharmacy and Non-Pharmacy Students.

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### Abstract

The objective of the present study was to evaluate awareness and significance of pictograms among pharmacy and non-pharmacy students. The study was conducted in two public and private sector institutes of Karachi during July to Oct 2013. Altogether 306 pharmacy and non pharmacy students participated in the study. A self administered questionnaire was used for this purpose. Nineteen pictograms from the USP-DI and corresponding set of 19 locally developed pictograms conveying the same medication instructions or messages were evaluated. Respondents were evaluated for their interpretation of all 38 pictograms. More than 98% of the pharmacy students agreed that pictograms attracts attention of people to provide information about medicine use. 97% considered that pictograms are used as universal language that can be easily understood by everyone and they are effective tools for educating the illiterate patients. 97.87% non pharmacy students agreed that patients are unfamiliar with medical terminologies and pictograms may be used to convey the medically significant information to patients. Both pharmacy and non pharmacy students preferred USP-DI pictograms over the pictograms of local origin. It is a need of time to introduce pictograms as a topic in curriculum of Pharm -D courses like Dispensing Pharmacy, Hospital pharmacy and Community pharmacy so that during professional life pharmacist can use these tools to improve patient counseling techniques. It is a way to maximize patient care and provide patient education regardless of any barrier.

**Keywords:** Pictograms; pharmacy and non pharmacy students; Pakistan.

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## **1. Introduction**

Patient education is defined as “a process used to provide knowledge to patients for the sake of their betterment and well-being.” This process is facilitated by health care members including physicians, dentists, pharmacists and nurses [1]. It imparts the benefit such as improving patients’ understanding about medicine use, increasing patient self-management, improving therapeutic outcomes, increasing patient compliance, and reducing adverse drug reactions etc. [2].

Pictogram is a significant tool of communication among patients and health care providers and can be helpful in improving patient compliance. It is a comprehensive expression, which is generally used to describe pictorials and symbols. Pictogram can be defined as “ordered symbolic images that assist to communicate the medication detailed directions to patients and purchasers”. They are also helpful for those people to convey them important information who find difficulty in reading and understanding because of low level of literacy. A pictogram provides the intended meaning of an object, direction or an idea. In pharmacy, pictograms are designed to assist people to convey the information about the method to take prescribed medication. They have been evaluated as an essential constituent of universal language as they communicate their message without dependence on language and culture. [3-6]

Use of pictogram is an effort to minimize adverse drug reactions, associated with poor understanding of written information, and to ensure appropriate use of medicines among all races, cultures and patients of different literacy level and to alert a patient about any harm.[5, 7, 8] Even sometimes educated patients also demand to have such information about drug use in emergency [9].

A pictogram is considered a replacement of written direction, instruction, prohibitory instructions and regulations therefore its appropriate designing is important otherwise it will not convey the intended message, which is recall of information about any medicine to the patient [10]. Many studies have been conducted to evaluate the awareness of pictogram at different levels worldwide, but in Pakistan no such study has yet been reported [10-13].

Therefore the present study was conducted to make a comparison of awareness between pharmacy and non pharmacy undergraduates about use of pictogram in Pakistan.

## **2. Materials and Methods:**

The study was conducted in two public and private sector institutes of Karachi during July to Oct 2013. Altogether 306 pharmacy and non pharmacy students participated in the study. A self administered questionnaire was used in the study. The demographic details of the students including name, age, gender and their educational status were collected. The questionnaire comprised of two parts; first part was focused on perception of pharmacy and non pharmacy students towards the use of pictograms. Second part comprised of thirty eight pictograms to assess the students’ understanding towards pictograms. Nineteen pictograms were obtained from USP –DI (United States Pharmacopoeia Dispensing Information) and nineteen were locally originated pictograms for conveying same medication instructions. The pairs of pictograms which conveyed the same instruction were presented to students through power point presentations clearly marked for Local and USP-DI. The questionnaire was clearly explained to the respondents that each slide of presentation contained two pictograms, one local and its USP-DI counterpart, both of which convey the same instruction. The respondents were then shown all the 38 pictograms and were asked to give their interpretation of each pictogram by writing in the space provided on the questionnaire. Respondent were also asked to indicate preferred and well understood pictogram i.e. USP-DI or locally originated. The participants were informed about the purpose of study and their consent was taken verbally. Ethical approval from respective heads of institutions was taken prior to conduct the research. The data obtained was analyzed on SPSS 20.0 to assess the response of the students.

## **3. Results and Discussion:**

The reasons of low level of patient adherence to their prescribed medications include decrease knowledge about disease condition and the inappropriate use of prescribed medications [14-17]. Several measures have been taken to increase patient compliance and knowledge about proper use of medications [18]. To organize educational programs and provide written instructions to the patients is laborious, expensive, time consuming and not suitable in a typical

clinical setup [19]. Patients are also directed to acquire information from leaflets and drug labels. Because of very small font size and complexity of the information it is not easy for patients to understand properly all the directions. [20]. This complexity of information become easy when the instructions are given in pictorial form and it is also recommended by National quality forum (NQF) and US Surgeon General [21-22].

In this regards, pictograms plays a pivotal role and each pharmacy institute has to focus on it. Therefore, the present study was conducted to make a comparison of awareness and significance between pharmacy and non pharmacy students about use of pictogram. The result showed that use of pictogram is convenient and easy way for providing medication related information. Pharmacists who have been provided the training about the understanding and interpretation of pictograms can contribute in improving the quality of life of the patient through patient counseling.

In the present study three hundred and six pharmacy student and non pharmacy students of private and public sector universities of Karachi provided responses for research purposes. One hundred and sixty five were pharmacy and one hundred and forty one were non pharmacy students. The demographic data is shown in Tables 1. More than 90% of the participants were female. This study comprises, 46.07% of the students enrolled in private institute and 53.92 % were enrolled in public sector institute.

Table 1 Characteristics of study population

<b>S.No</b>	<b>Characteristics</b>	<b>Number (Percentages)</b>
<b>1</b>	<b>Gender</b>	
	Male	24 (7.8%)
	Female	282 (92.2%)
<b>2</b>	<b>Education status</b>	
	Pharmacy students	165 (53.92%)
	Non Pharmacy students	141 (46.07%)
<b>3</b>	<b>Institute</b>	
	Private	141 (46.07%)
	Public sector	165 (53.92%)

Perception of these students towards the use of pictograms is recorded in Table 2. More than 98% of the pharmacy students agreed that pictograms attract attention of people to convey relevant information. 97% considered that pictograms are used as universal language and effective tools for educating the illiterate patients. Whereas 97.87% non pharmacy students agreed that patients are unfamiliar with medical terminologies. Therefore pictograms are used to educate patients.

Table 2 Perception of pharmacy and non-pharmacy students towards the use of pictograms

Opinion	Pharmacy students			Non pharmacy students		
	Yes	No	Don't know	Yes	No	Don't know
Pictograms facilitate to understand the use of drug	148(89.7%)	8(4.84%)	9(5.45%)	136(96.4%)	2(1.41%)	3(2.12%)
Patients are unfamiliar with medical terminologies	159(96.3%)	2(1.21%)	2(1.21%)	138(97.87%)	1(0.70%)	2(1.41%)
Pictograms attract attention of people to information that has to be conveyed	163(98.8%)	0	2(1.21%)	132(93.61%)	4(2.83%)	5(3.54%)
Pictograms enhance adherence of people towards the use of medicines	159(96.3%)	3(1.81%)	3(1.81%)	135(95.74%)	4(2.83%)	2(1.41%)
Pictograms are effective tools for educating the illiterate patients	160(97%)	3(1.81%)	2(1.21%)	139(92.9%)	2(1.41%)	0
Pictograms are used as universal language that can be easily understand by everyone	161(97.6%)	1(0.60%)	3(1.81%)	138(97.87%)	1(0.70%)	2(1.41%)

As illustrated in Table 3, 70% of the students interpret the pictograms correctly. Approximately 12% and 15% interpret the pictograms incorrect and partially correct respectively. 4% of the students did not give their response properly.

Table 3 Understanding of pharmacy students towards pictograms

S.No	Correct	Incorrect	Partially correct	No response
1	35(21.21)	113(68.48)	10(6.06)	7(4.24)
2	87(52.72)	47(28.48)	11(6.66)	20(12.12)
3	139(84.24)	8(4.84)	13(7.87)	5(3.03)
4	53(32.12)	48(29.09)	5(3.03)	59(35.75)
5	157(95.15)	4(2.42)	2(1.21)	2(1.21)
6	138(83.63)	13(7.87)	2(1.21)	12(7.27)
7	64(38.78)	28(16.96)	71(43.03)	2(1.21)
8	140(84.84)	11(6.66)	10(6.06)	4(2.42)
9	133(80.60)	9(5.45)	14(8.48)	9(5.45)

10	138(83.63)	14(8.48)	9(5.45)	4(2.42)
11	154(93.33)	6(3.63)	4(2.42)	1(0.60)
12	109(66.06)	26(15.75)	27(16.36)	3(1.81)
13	107(64.84)	25(15.15)	29(17.57)	4(2.42)
14	144(87.27)	6(3.63)	5(3.03)	10(6.06)
15	131(79.39)	17(10.30)	15(9.09)	2(1.21)
16	79(47.87)	29(17.57)	46(27.87)	11(6.66)
17	120(72.72)	11(6.66)	24(14.54)	10(6.06)
18	154(93.33)	7(4.24)	3(1.81)	1(0.60)
19	161(97.57)	1(0.60)	3(1.81)	0

Fig. 1 illustrated the response of pharmacy students towards pictograms of USP and local origin. 39.05% and 36.21% voted for USP and local pictograms are more effective to convey message respectively.

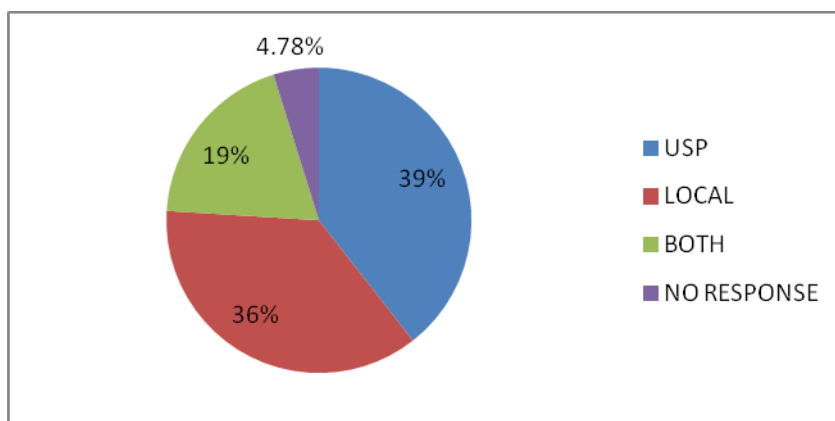


Fig.1 Response of pharmacy students towards pictograms of USP and local origin

Table 4 revealed the understanding of non pharmacy students towards pictograms. Nearly 55% of those students interpreted the pictograms correctly. Approximately 24% interpreted incorrect, 16% interpreted partially correct and near about 4% did not give response completely.

Table 4 Understanding of non-pharmacy students towards pictograms

S.No	Correct	Incorrect	Partially correct	No response
1	0	140(99.29)	1(0.70)	0
2	24(17.02)	94(66.66)	18(12.76)	5(3.54)
3	109(77.30)	21(14.89)	11(7.80)	0
4	43(30.49)	76(53.90)	20(14.18)	2(1.41)
5	129(91.48)	4(2.83)	7(4.96)	1(0.70)
6	115(81.56)	17(12.05)	9(6.38)	0
7	58(41.13)	34(24.11)	49(34.75)	0
8	96(68.08)	33(23.40)	11(7.80)	1(0.70)
9	94(66.66)	32(22.69)	12(8.51)	3(2.12)
10	124(87.94)	11(7.80)	4(2.83)	2(1.41)
11	126(89.36)	13(9.21)	2(1.41)	0
12	15(10.63)	25(17.73)	98(69.50)	2(1.41)
13	20(14.18)	27(19.14)	89(63.12)	4(2.83)
14	92(65.24)	39(27.65)	7(4.96)	2(1.41)
15	113(80.14)	8(5.67)	19(13.47)	0
16	52(36.87)	26(18.43)	61(43.26)	2(1.41)
17	58(41.13)	45(31.91)	36(25.53)	2(1.41)
18	126(89.36)	14(9.92)	1(0.70)	0
19	98(69.50)	1(0.70)	1(0.70)	41(29.07)

The response of non pharmacy students towards pictograms of USP and local origin is shown in Fig.2. Approximately 37% voted for USP and 28% preferred local pictograms as more effective tool to educate patients about the use of medicine. Some of the pictograms originated from USP-DI and local, were not understood by all students due to complexity and closeness to other pictograms. Some studies reported locally designed pictograms have found more comprehensible than standard [14].

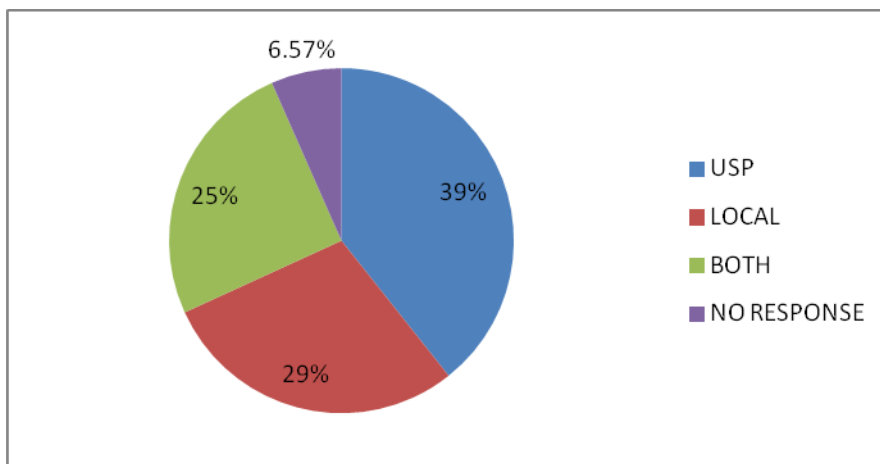


Fig.2 Response of non-pharmacy students towards pictograms of USP and local origin

#### 4. Conclusion:

Use of pictogram is an effort to minimize adverse drug reactions, associated with poor understanding of written information, and to ensure appropriate use of medicines among all races, cultures and patients of different literacy level and to alert a patient about any harm. This is the need of time to introduce pictograms as a topic in curriculum of Pharm-D courses so that during professional life pharmacist can use these tools to improve patient counseling techniques. It is a way to maximize patient care and provide patient education regardless of any barrier.

#### Conflict of Interest:

Authors declared no conflict of interest.

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