

University of Lisbon

Faculty of Pharmacy



**Assessing pharmaceutical pictograms amongst cultural
minorities: the example of Hindu patients speaking European
Portuguese**

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Resumo

Uma das principais limitações à obtenção de resultados em Saúde positivos é o incumprimento dos planos de tratamento, sendo umas das suas causas as barreiras de comunicação entre os profissionais de saúde e os doentes. Vários autores procuraram formas de transpor esta tendência, sendo o método mais consensual a utilização de pictogramas.

Os pictogramas são uma forma de comunicação baseada na representação pictorial de uma dada informação. Ainda que frequentemente correlacionados com uma melhor compreensão dos regimes terapêuticos, viabilizando melhores resultados, estes possuem algumas limitações. Os pictogramas podem levar a interpretações erróneas caso não sejam os mais adequados para uma dada comunidade, devendo então ser testados.

O objetivo deste estudo é averiguar a viabilidade de uso de pictogramas nas farmácias da área de Lisboa, nomeadamente para populações estrangeiras. Para tal, foi desenvolvido um questionário que permitisse estudar a assimilação da informação transposta pelos pictogramas para a comunidade Hindu de Lisboa. Os pictogramas foram obtidos por duas fontes, pela United States Pharmacopeia Dispensing Information (USP-DI) e pela International Pharmaceutical Federation (FIP), permitindo assim a comparação das suas características visuais com a facilidade de veiculação da informação.

Observaram-se dificuldades na compreensão dos pictogramas estudados, possivelmente devido à reduzida fluência dos participantes na língua Portuguesa. Os resultados apontam para uma maior facilidade de interpretação dos pictogramas da USP que os da FIP, havendo também melhor compreensão em pictogramas com múltiplas imagens, com marcas que indiquem negação e em pictogramas que não veiculem informação relativa à administração.

Como os resultados indicam, os pictogramas não deverão ser usados numa determinada população sem estudos prévios, podendo ser necessária a adaptação destas imagens para a comunidade em questão. Não devemos descontinuar também a importância das outras formas de comunicação com os doentes, sendo os pictogramas um complemento aos métodos atualmente utilizados.

Palavras-Chave: Pictogramas, comunicação em saúde, comunidade Hindu, USP, FIP.

Abstract

One of the sources of poor health outcomes is the lack of compliance to the prescribed treatment plans, often due to communication barriers between healthcare professionals and patients. Several authors researched ways to overcome these events, with one of the regularly found suggestion being pictograms.

Pictograms are a form of communication based on pictorial representation of the information that is being conveyed. Albeit being often correlated with better comprehension of treatment regimens, leading to positive results, they are still subject to limitations. Pictograms can lead to misinterpretations if they're not suited for the community in hand, thus requiring testing.

The goal of this study is to examine the possibility of using pictograms in the pharmacies of Lisbon, namely for foreign populations. For that, a questionnaire was developed to allow a research about the understanding of pictograms by the Hindu community of Lisbon. Pictograms were gathered in two different sources, the United States Pharmacopeia Dispensing Information and the International Pharmaceutical Federation, allowing for the comparison of their designs with the facility in comprehension of the relayed information.

There were difficulties in the understanding of the selected pictograms, possibly due to the reduced fluency of some participants in Portuguese. Results show a better interpretations of USP pictograms when compared to FIP pictograms, and also a better understand of pictograms composed of multiple images, with negative marks or those that don't convey information regarding the medication.

As our results indicate, pictograms should not be used in a specific population without previous studies, as they may require refining for the community at hand. In addition, we shouldn't disregard other forms of communication with the patients, as pictograms are a complement to the currently used methods.

Keywords: Pictograms, communication in health, Hindu community, USP, FIP.

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Introduction

Community Pharmacists and Current Practice Challenges

Pharmacists are the healthcare professionals who are the core of safe and effective use of medication. Through their education, they learn about the drugs' actions, uses, possible interactions and side effects. Accordingly, their primary mission has traditionally been to dispense and distribute drugs, but being most accessible healthcare providers, their role has been subject to change (1, 2).

Nowadays, there has been an increased focus in the pharmaceutical care (3). The focus has shifted from the medicines in themselves to the patients who take them. There has been an attempt to include pharmacists in the primary healthcare system. Pharmacists are now tasked of – besides providing patients with quality products and therapy management information – to actively contribute to patients' outcomes, improving their medical compliance (synonym: adherence), and monitoring adverse effects and the effectiveness of the prescribed treatment regimen (1, 3).

Compliance can be defined as "the extent to which a patient acts in accordance with the prescribed interval, and dose of a dosing regimen." (4). The lack of compliance can lead to an increase in healthcare costs and the undesired health outcomes, as well as a lower work productivity amongst patients (5-7). This inadequate adherence can have several causes, like cost and complexity of the regimen, but one of the motives which has been researched by several authors are communication barriers between the health professionals and the population (5, 8, 9).

The communication barriers can have different sources. Most often are due to language barriers or limited education and low health literacy of the population. These limitations are most commonly found when people don't speak the same language, and among the elderly (8-10).

Regarding the question of mother tongue, several attempts have been made to invent an international language, and despite the efforts with Esperanto or Basic English, for instance, no language has reached the entire population worldwide. As we can see nowadays, in different countries, even those bordering one another, the same object can have different names. If we look at different cultures, like countries in Europe and India or China, we can see that they even use different alphabets (11).

There have been different approaches to overcome this challenge, such as the use of pictures, symbols, audiotapes or interpreters. (8) One of the possibilities is the use of pictograms.

What are pictograms?

Pictograms are pictorial representations of ideas or actions, which convey their meaning independent of any particular culture or language. As portrayed by Kolers, P., a cow looks like a cow in any part of the globe. If we understand the code, a drawing of a cow in Portugal will portray a cow in India or in China, thus bypassing the cultural and language barriers (11).

Despite their advantages, pictograms are not without flaws. People living in different environments can have different interpretations of the same sign. A cow for a Hindu can have cultural relevance not found in other nations (11, 12).

One of the basis for the use of pictograms in a multicultural environment is their universality – they should offer the same meaning regardless of language, culture, or education (8, 13). Since most pictograms have been designed in the western society, with a different background from eastern societies, there is a need to gather cross-cultural data about their suitability worldwide (8, 14, 15).

Uses of pictograms

We can find pictograms on a daily basis, on multiple different occasions.

Pictograms are used to quickly transmit information, as seen in the entrance of public toilets to distinguish between women and men, in spray cans to warn us about the safety hazards, on the roadways as the road signs, or even on our electronic devices, with the play and pause buttons or the mail icon.

The general use of these pictograms are indicative that these can be a functional method of communication in a multicultural society.

In the pharmaceutical field, pictograms disclose instructions or warnings regarding the use of medication (9, 13). They are able to reinforce both apprehension and recalling of

information, attract attention and reduce misunderstandings regarding the treatment (12, 16).



Image 1 – 1. Female and Male pictograms (17); 2 and 3 - Traffic Signs (18); 4 - Flame pictogram (19); 5 – Pause and Play Icons 6 – Email Icon (20). Adapted.

Pictogram’s Design

As with other types of symbols, such as the icons used on the digital environment, there are a number of characteristics that could influence how the users interpret the images they are presented. Visual intricacy, concreteness, simplicity, or even the shape and color of the illustrations can help direct our discernment of the information or, if not well tailored, misguide its assimilation (21, 22).

For the specific case of pictograms, other attributes like the design of the frames, marks expressing negation, like crosses or strike-throughs, specific body parts and marks for pain and movement can lead to a decline in comprehension (23).

As mentioned above, while fitting one population, the same design may not be suited for another. Familiarity also plays a role in understanding the visual aids, and as such tests are required to inspect the appropriateness of these models for specific communities (21, 24).

Pictograms for use with pharmaceuticals

A few sets of pharmaceutical pictograms have been developed by different organizations, like the Risk-benefit Assessment of Drugs-Analysis and Response (RAD-AR) Council of Japan pictograms, the United States Pharmacopeia Dispensing

Information pictograms (USP) and the International Pharmaceutical Federation (FIP) pictograms (25-27).

The USP pictograms have been the most widely studied in the western community, with results published by several authors regarding their usability and legibility by different communities (8, 10).

On the other hand, the FIP pictograms have been developed more recently (June 2009), and have been tested in European and North American populations, so they could be more suited for a multi-cultural society (27, 28).

Studies regarding pharmaceutical pictograms

There have been several studies worldwide regarding pharmaceutical pictograms, with the United States Pharmacopeia Dispensing Information pictograms (USP) being some of the most widely studied. During these studies, some of the selected pictograms were more easily comprehended than others, revealing that the USP pictograms might have limitations for certain sub-populations (8-10, 29). This can be related to the cultural background of the respondents, as shown by Dowse, R., in his study of pharmaceutical pictograms in a South African population, where the local pictograms were more easily understood and preferred compared to the USP pictograms (29).

In Portugal is a study about the legibility of USP pictograms by Soares, M. (October 2012), where the ability of patients to understand a set of 15 pictograms was tested, using different criteria to assess legibility. One of the criteria used was the International Standards Organization (ISO) 3864, which considers as legible icons with over 67% of correct results. There were various different interpretations on these pictograms, with only 10 of them being legible by the ISO 3864 criteria, also pointing to the limitations in their understanding by the Portuguese population. This was particularly relevant with low literacy and foreign communities, who are the main focus for the development of pictograms (30).

Should we use pictograms in Portugal?

Seeing Soares, M.'s study in Portugal focused on the general population in Lisbon, there is an opportunity to further study this subject using a specific foreign community, such as the Hindu community. The Hindu community of Lisbon is in growth, with 6160 emigrants who were born in India before the end of 2009, and more from other countries like Mozambique, Pakistan and Bangladesh (31). This could further enlighten the possibility of use of pictograms in Portuguese community pharmacies.

Also, as during previous studies the USP pictograms revealed some limitations, in particular regarding multicultural societies or those with low literacy levels, different pictograms systems, like those proposed by the International Pharmaceutical Federation (FIP), could be better suited for this community.

Objectives

The aim of this study is to investigate the understanding of pictograms, namely from the United States Pharmacopeia (USP) and the International Pharmaceutical Federation (FIP), by the Hindu population in the area of Lisbon e Vale do Tejo.

By assessing the understanding of pharmaceutical pictograms on this community, we can infer if the use of pictograms is a viable form of communication with the Hindu population living in Lisbon e Vale do Tejo, especially for those with poor command of Portuguese. Their use during the medical and pharmaceutical practice can improve outcomes in health, namely through community pharmacies' enhancement of prescribed therapy adherence.

With this study, we also seek to find if there are major differences in the interpretation of the two sets of pictograms, the USP and the FIP. Analysis of the design of the pictograms can help us infer if there are any specific qualities that lead to more correct discernment of their meaning. This could allow the refinement of the current pictograms to better match the perceptiveness of the multicultural society that is spreading all around the globe.

Materials and Methods

Study sample

This study was conducted on a convenience sample of 50 Hindu individuals. These individuals were selected from two different Hindu temples, Radha Krishna Temple and Shiv Temple in Lisbon, between March 2017 and August 2017.

The sample included people over the age of 18, from both genders and with different levels of education and income. Individuals who lived in India for less than 5 years, who can't read Portuguese and who had health conditions which prevented them from interpreting the pictograms were excluded.

Those following the inclusion/exclusion criteria were personally invited by the field researcher to participate, after informed consent. The study followed all ethical research principles, particularly concerning participants' full anonymity and data confidentiality, after ethical approval by the Faculty of Pharmacy committee and with respect for the principles stated in the current Portuguese law of personal data protection (32).

Materials

The 30 pictograms used in this study were selected from the USP and the FIP sets of pictograms. The 15 USP ones were using information from previously published work: 7 pictograms that were harder to understand and 8 pictograms that were more often correctly. The 15 FIP pictograms were those that conveyed an equal or similar meaning to the selected USP ones.

The questionnaire developed consisted of three sections.

The first one was where participants' socio-demographic data was collected (age, gender, place of birth, scholarship level, income), as well as a self-assessment of their Portuguese proficiency.

Next, there was a section showing the 30 previously selected pictograms, each one followed by 3 corresponding interpretations, with one correct and two incorrect options, all written in European Portuguese. The correct answer was obtained from the USP pictograms' titles. The incorrect interpretations were provided by 5 members of the

Hindu community in Lisbon, who speak and write Portuguese fluently, in our pilot-study; these qualitative-based pilot-study interviews allow for an informal consensus on the wrong options, working as well to confirm the completeness and easiness of the research questionnaire for the members of the community.

Respondents were asked to select the option they considered to be correct. Each correct answer would net the inquired a score of 3, while an incorrect answer would give the score of 1. A total score was computed, varying from a minimum of 1 and a maximum of 3 points.

In the last section, we asked the inquired about previous experiences with pictograms and their feedback about the survey.

A field researcher was present at the time of the questionnaire administration, being any participants' voluntary questions explained.

Analysis

The results were analyzed using the IBM SPSS Statistics software, version 24. The statistics performed included descriptive results, Students' t-tests, Persons' Chi-Square tests and ANOVA. A confidence level equivalent to $p < 0.05$ was used in all the tests.

During the analysis, three of the pictograms' design attributes were also studied.

First, the pictograms were divided by the number of images that composed them. They were arranged by pictograms composed of 1 frame, or pictograms composed by multiple frames.

The second characteristic analyzed was the presence of any cross or strike, marking negation. The pictograms were separated in two groups, depending on whether they had any of these marks or not.

Our third selected attribute regarded the information conveyed on the pictograms. The pictograms were divided in accordance to if they carried instructions regarding how to take or apply the medicine, or if they relayed other information regarding the medication, such as contraindications or side-effects.

Results

Socio-demographic data

The participants in this study were mostly male (62%), with a good spread of ages. 36 of them had Indian passport (72%), while the rest had Mozambican, Pakistani or Bangladeshi passports. 44% of the respondents have been in Portugal for 5 or less years, while 30% lived there for more than 20 years. A large group studied for more than 12 years (46%), and 66% of them completed their education in India, while 12% studied in Portugal, and the rest went through their academics in Pakistan, Mozambique and Bangladesh. Despite their high scholarships degrees, when asked to classify their Portuguese fluency in a scale from 0 to 10, 22 (44%) out of the 50 participants rated their fluency to be 5 or below (considered “poor”), while the other 28 (56%) deemed their aptitude as 6 or above (considered “good”). For reference, this classification will be used during further data analysis, with the first group being called Sub-Sample A (n = 22), and the second being named Sub-Sample B (n = 28). The majority of the participants admitted to having a low family income (68% under 1000€).

In case of a minor ailment, most participants said would go to the pharmacy seeking assistance (72%), even though 64% of them has a family doctor. Only 1 person has admitted to having a chronic illness, whereas 39 people (78%) reported taking medicines less than once a month.

More importantly, when they do have a health issue, 52% of the respondents said they would seek Traditional Hindu Medicine, while 22% will look first for help by Western health professionals. The rest of them resorted to self-medication or no treatment at all. In case of self-medication, half of the participants would acquire their treatment on a pharmacy, while one third of them would acquire those on the Internet.

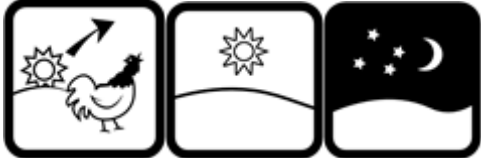

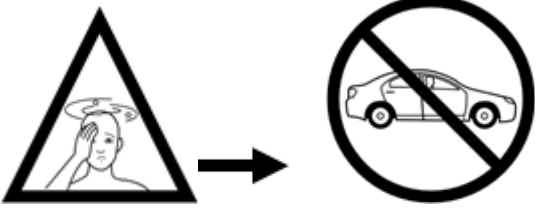

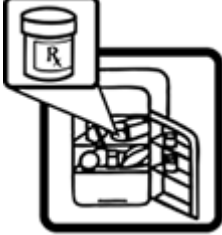
When further analyzing the data with Persons’ Chi-Square tests, we found that both the amount of time the respondents have lived in Portugal, as well as their education level had influence on their self-appraised fluency in Portuguese (respectively, $\text{Chi}^2 = 6.445$, $p = 0.04$ and $\text{Chi}^2 = 5.547$, $p = 0.019$). On the other hand there was no significant influence of the location where the participants studied on their Portuguese skills.




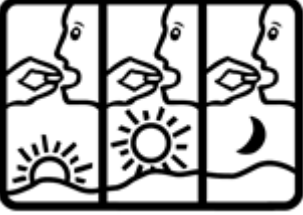



Their dexterity in the language was also not impacted by their family income, their habits when afflicted by a minor ailment, nor the presence of a family doctor.







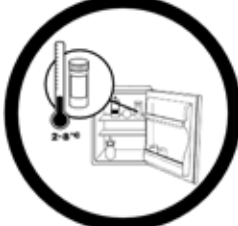
Pictogram's Results


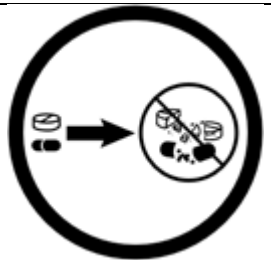




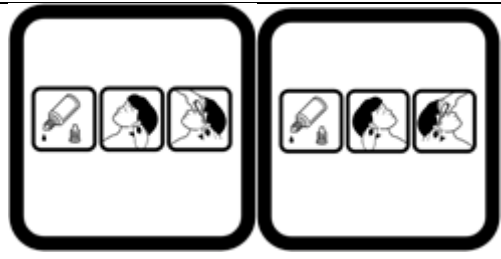
Regarding the pictograms themselves, the scores obtained for each of them are displayed in Table 1.


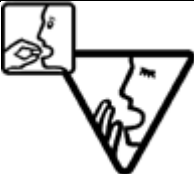


Table 1. Pictograms used, pictogram's meaning and number of correct answers per pictogram.

	Images	Pictogram Meaning	Correct answers (%)
Pictogram 1		Take this medicine in the morning, afternoon and at night	19 (38%)
Pictogram 2		Don't take this medicine if pregnant	24 (48%)
Pictogram 3		If this medicine makes you dizzy, don't drive	25 (50%)
Pictogram 4		Take this medicine with an empty stomach	19 (38%)
Pictogram 5		Store this medicine in the fridge	24 (48%)

Pictogram 6		Keep this medicine out of the reach of children	32 (64%)
Pictogram 7		Don't drink alcoholic beverages during treatment with this medicine	15 (30%)
Pictogram 8		Don't break the tablets nor open the capsules	20 (40%)
Pictogram 9		Take this medicine 3 times per day	5 (10%)
Pictogram 10		Don't take this medicine if breastfeeding	17 (34%)
Pictogram 11		Take this medicine with meals	20 (40%)
Pictogram 12		Insert the medicine in the vagina	23 (46%)

Pictogram 13		Don't take this medicine with meals	26 (52%)
Pictogram 14		This medicine can cause sleepiness	18 (36%)
Pictogram 15		Don't take this medicine if breastfeeding	33 (66%)
Pictogram 16		Don't drink alcoholic beverages during treatment with this medicine	23 (46%)
Pictogram 17		Wash your hands before and after applying this medicine on the ear	24 (48%)
Pictogram 18		Keep this medicine out of the reach of children	9 (18%)
Pictogram 19		Store this medicine in the fridge	18 (36%)

Pictogram 20		Shake this medicine before using	26 (52%)
Pictogram 21		Don't break the tablets nor open the capsules	26 (52%)
Pictogram 22		Don't take this medicine if pregnant	14 (28%)
Pictogram 23		Take this medicine with meals	12 (24%)
Pictogram 24		Drink this medicine with an extra glass of water	12 (24%)
Pictogram 25		Shake this medicine before using	22 (44%)
Pictogram 26		Apply one drop of this medicine on the left and on the right ears	18 (36%)

Pictogram 27		Wash your hands before and after applying this medicine on the vagina	35 (70%)
Pictogram 28		This medicine can cause sleepiness	26 (52%)
Pictogram 29		If this medicine makes you dizzy, don't drive	17 (34%)
Pictogram 30		Take this medicine with water	17 (34%)

The sample's average score was 1.825 ($\sigma = 0.343$). The highest score was 2.67, while the lowest was 1.27.

Only 1 respondent saw pictograms before responding to this questionnaire, although 38 (76%) of them considered that pictograms would be helpful for the correct understanding of treatment plans.

When analyzing the USP and the FIP pictograms separately, the average scores were, respectively, of 1.915 ($\sigma = 0.369$), and 1.736 ($\sigma = 0.372$). The USP pictograms had a statistically significantly higher score ($t = -3.401$, $p = 0.001$).

When exploring total score differences between sample sub-populations, there was no significant difference between male and female respondents, nor between people with different nationalities. There was, though, a statistically significant relation between the assumed Portuguese eloquence and the score the participants reached ($t = -3.008$, $p = 0.004$). As a follow-up, we also tested the reported ability in the language against the

USP pictograms and against the FIP pictograms, revealing a relation with both pictorial sets (respectively, $t = -2.983$, $p = 0.004$ and $t = -2.525$, $p = 0.01$).

We calculated the total average scores for the USP and FIP pictograms for the Sub-Sample A with USP average equaling 1.752 ($\sigma = 0.360$) and FIP average 1.594, ($\sigma = 0.325$). In this case, the average score for the FIP pictograms was still significantly lower than the average score for the USP pictograms ($t = -2.268$, $p = 0.034$).

Several variables have been tested against the average scores of the participants, both for the entire sample and for Sub-Sample A. These variables included:

- The respondents' consideration of pictograms relevance;
- The respondents' consideration of the questionnaire relevance;
- Their family incomes;
- Their habits when afflicted by minor ailments;
- Having family doctors.

No significant correlations have been found on any of these cases.

Pictogram design tests

Afterwards, the pictograms were divided into groups according to some of their graphic characteristics. The average score of the groups was calculated and compared with Students' t-test, for the entire sample, Sub-Sample A and Sub-Sample B.

The means and standard deviations for these tests are displayed on Table 2.

The first studied attribute was the number of images composing the pictogram. There were 12 (40%) pictograms consisted of 1 image, and 18 (60%) formed by multiple images. When comparing these groups, for all 3 samples, our tests revealed that the pictograms comprised of multiple images achieved significantly higher total scores than the ones with only one image (Sample: $t = -3.914$, $p = 0.001$; Sub-Sample A: $t = -2.615$, $p = 0.016$; Sub-Sample B: $t = -3.088$, $p = 0.005$).

Then, the presence of negative markings was analyzed. 13 (43%) pictograms had these symbols, while 17 (57%) of them didn't. The averages were not significantly different when focusing on the entire sample and the Sub-Sample A, but the group of pictograms

with these marks had a significantly higher mean when analyzing the responses of Sub-Sample B (Sub-Sample B: $t = -3.345$, $p = 0.002$).

The last characteristic studied was the type of information conveyed on the pictograms. The first group, carrying instructions was composed of 18 (60%) pictograms, while the second group, transmitting other information, amounted to 12 (40%) pictograms. As with the second aspect we researched, only Sub-Sample B revealed a significant difference between these groups of pictograms (Sub-Sample B: $t = -2.421$, $p = 0.022$).

Table 2. Means and Standard Deviation for pictogram design tests

		Sample		Sub-Sample A		Sub-Sample B	
		Average	σ	Average	σ	Average	σ
Test 1	1 Image	1.683	0.428	1.553	0.358	1.786	0.456
	2+ Images	1.920	0.346	1.753	0.341	2.052	0.292
Test 2	Negation Marks	1.865	0.445	1.615	0.394	2.060	0.385
	No Neg. Marks	1.795	0.319	1.717	0.306	1.857	0.322
Test 3	Instruction	1.804	0.343	1.707	0.313	1.881	0.351
	Others	1.857	0.429	1.621	0.392	2.042	0.365

Discussion

This study addressed the comprehension of a widely accepted resource for safe and effective medication use by patients with communication barriers, such as those presenting language barriers.

Study's Limitations

There were some difficulties during the application of the questionnaire.

One of the issues was the lack of interest in completing the survey. This was overcome by reminding the respondents of the importance of this matter, especially since they are part of the group that should benefit the most from the usage of pictograms in community pharmacies, but there were still some people who disregarded this possibility.

Another issue was the extension of the questionnaire. During our pre-tests, the participants took an average of 11 minutes to complete it, but during our data acquisition, people often took longer to respond, due to poorer understanding of the questions or due to external distractions. Because of this, 18 persons who started answering the questionnaire gave up during this process, even receiving support from the field researcher.

Lastly, the respondents showed some difficulty understanding the questions, including the options regarding the meaning of each pictogram. Several of the respondents didn't have enough literacy to be able to properly interpret the questions and the possible answers they were given. This was bypassed by translating their meaning to Hindi when necessary, allowing the participants to properly interpret the questionnaire.

Study's Results

Regarding the average scores obtained, only 1 pictogram would be legible by the ISO-3864 criteria. This is much lower than desirable, in particular when comparing to legibility tests performed by other authors (30). This could be related to the education of

our participants, or be influenced by other factors, like the interpretation of the different possible answers, which were given in Portuguese.

One of the questions on the socio-demographic section asked our participants to rate their Portuguese fluency, thus allowing comparison of this data to the average score of the participants. An association was found between these two variables, indicating that the Portuguese literacy of our respondents could have been one of the limiting factors for the interpretation of the possible options regarding the meaning of the pictograms. This fact is important, knowing that in most community pharmacies, the patients will be attended to in Portuguese, including written instructions given, and therefore Hindu patients' proficiency could still prove a limiting factor for the correct use of medication during real life events.

The statistical association between respondents' self-acclaimed aptitude and both the time spent in Portugal, and the formal education, but the lack of correspondence found when the fluency was tested against the country where they graduated could indicate that the participants considered their Portuguese comprehension relied to their daily usage of the language, rather than their studies.

The absence of correlation between the total score and socio-demographic variables such as earnings, routines when facing lesser health disorders, and the presence or lack of a family physician indicates that these factors had no influence on the general understanding of pictograms. Summing up to the reported language barriers, the actual focus should fall on adjusting the communication to this population in order to start applying pictograms on this community.

The lack of correlation between the average scores of the participants and their appreciation on the pictograms' and the questionnaire's relevance indicates that the participants' difficulty during the interpretation was not a limiting factor when faced with the possibility of use of pictograms in future treatment plans. Coupling that with the high percentage of people considering pictograms as helpful to understand their medicine regimens, this population might be open to the use of pictograms for medications provided in Portuguese community pharmacies.

USP and FIP sets' Results

When comparing USP and FIP pictograms, we were expecting FIP pictograms to relay the information more precisely as a result of them being more recent and tested with individuals from different cultures around the world. The USP pictograms were elaborated beforehand and were possibly not as thoroughly tested for use in countries other than the United States during development stages. This, though, did not verify, as the average total score obtained on USP pictograms was significantly higher than the average total score obtained on FIP pictograms. This is also true when comparing the results from the subgroup of individuals rating their Portuguese ability as “poor”. These results indicate that the USP pictograms could be better suited for the Hindu population living in Lisbon than the FIP ones.

Pictograms' Design

Concerning the design of the studied pictograms, we come across some interesting finds. Our results demonstrated a better understanding of pictograms constituted of multiple images (up to three) when comparing to the ones with only one. This goes against what has been presented by other authors, suggesting against the use of multiple images (23, 24). Our results could indicate that, for this population, single image pictograms try to transmit too much information for the smaller amount of items, while with multiple images, the meaning of a poorly understood object can be inferred through the other presented graphic components.

The other two studied aspects, the presence of negative marks and the type of information relayed, revealed different levels of significance depending on the sample used. There was only a statistically significant result when we analyzed the sub-population of individuals who consider themselves eloquent in Portuguese. This can derive from the fact that the scores from the other participants were too heavily stirred by the difficulty in interpreting the answers.

The analysis of the pictograms with a negative connotation showed that these were more easily interpreted than the ones without them. This is also different from what we'd expect considering the published literature (23, 24). This could derive of some particular characteristic of this Hindu Community, or of the pictograms with negative

marks having less intricate information to be relayed. To confirm this possibility, a future study using pictograms conveying similar meaning, with and without the negative association, needs to be performed.

Finally, the pictograms with instruction on how to take or apply the medicine were seldom understood when compared to pictograms transmitting other information, on the Sub-Sample B. This can indicate that instruction messages, which are drug administration processes, try to provide more information than other pictograms. As a result, there could be an increase in complexity leading to diminished levels of understanding.

Conclusion

As many authors have stated in the past, pictograms are a great form of passing on treatment specifications, but, as we've been during our work, that doesn't mean healthcare professionals should use them without care. Culturally challenging populations, such as the Hindu Community in Portugal, indicate that well intentioned illustrated instructions may fail their mission.

Prior to general usage, local populations need to be evaluated in their understanding of such tools as the pictograms, and, if necessary, refining should be made based on the ability of that specific society to interpret different pictograms, with their own specificities in design and information. Otherwise, healthcare providers risk misguiding their patients, worsening outcomes in health treatments, with all the possible consequences to arrive from those. Regardless, the Hindu community in Portugal is receptive to this method of communication.

The results obtained during this study should not dissuade future tests in this area, as pharmaceutical pictograms are a tool to be used by healthcare providers to facilitate the advisement and retention of information by the patients and members of the society. Actually, this resource is poorly used in the Portuguese pharmacy practice. Increasing their application is not a mean to replace other forms of communication, but to complement them. Therefore, studies comparing the understanding of treatment plans with the use of the current communication tools, with and without the use of pictograms, could provide a better consideration of the payoff advent the use of pictograms.

Future prospects

In future tests, a more adequate method for testing pictograms should be developed.

In case of an inquiry, a smaller questionnaire should be made, especially in regards to the amount of pictograms studied. The language should also be clearer to alleviate the errors due to misunderstanding of the questions or answers.

Another possibility to reduce the possibility of misinterpretation due to language barriers is performing interviews. This way, the interviewer should be able to properly transmit the information required to every singular participant, in hopes to overcome this limitation.

Further study is required to assess if the poor the average score in our tests were due to this limitation, another factor, or if these pictograms are not suited for the population at hand. In the latter case, other suitable alternatives should be investigated before dismissing the use of pictograms. For this, adaptations of the ones tested on this work could be used to accommodate the needs of this community.

Other specific sub-populations from Portugal should also be analyzed, for the cross-testing could provide valuable information regarding the general population of Lisbon and how to further improve on this subject.

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Annexes

Annex 1: Questionnaire

PictoPT

Avaliação de pictogramas farmacêuticos entre culturas minoritárias: caso de estudo de utentes chineses e hindus que falam português

O presente inquérito serve de base a um trabalho para tese de Mestrado Integrado em Ciências Farmacêuticas da Faculdade de Farmácia da Universidade de Lisboa.

Todos os inquéritos estão sobre um acordo de confidencialidade, não sendo divulgados para qualquer outro fim e todos os dados são tratados de forma agregada.

A sua resposta é fundamental para nós.

Desde já, muito obrigado! आपको बहुत बहुत धन्यवाद! 非常感谢!

Secção 1: Sócio-demografia

1. Idade: _____ anos

2. Sexo

- a) Masculino
- b) Feminino

3. Tem passaporte(s) de que país(es)?

- a) Português
- b) Chinês
- c) Hindu
- d) Outro Qual/quais? _____

4. Local ou cidade onde nasceu? _____

5. Há quanto tempo reside em Portugal? _____ anos

6. Durante quanto tempo residiu na China ou Índia? _____ anos

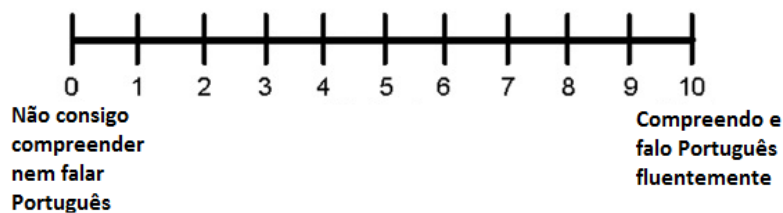
7. Quantos anos de educação completou?

- a) Sem escolaridade
- b) 1 - 4 anos
- c) 5 - 6 anos
- d) 7 - 9 anos
- e) 10 - 12 anos
- f) + 12 anos

7.1. Em que país completou essa escolaridade?

- a) Portugal
- b) China
- c) Índia
- d) Outro _____

8. De 0 a 10, considerando 0 “não consigo compreender nem falar em Português”, e 10 “compreendo e falo Português fluentemente”, como considera a sua facilidade em compreender e falar em Português?



9. Em média, quanto recebe a sua família, por mês?

- a) <600€
- b) 600-1000€
- c) 1000-1400€
- d) 1400-1800€
- e) >1800€

10. Quando tem um ligeiro problema de saúde (por exemplo, uma constipação ou diarreia), a quem se costuma dirigir?

- a) Família
- b) Amigos
- c) Farmácia
- d) Médico
- e) Outros _____

11. Tem médico de família em Portugal (por exemplo, num centro de saúde ou num consultório privado) ?

- a) Sim
- b) Não

12. Tem alguma doença crónica? Qual/quais?

- a) Sim

12.1. Se sim, qual/quais? _____

- b) Não

13. Com que frequência toma medicamentos?

- a) Menos de 1 vez por mês
- b) Menos 1 vez por semana
- c) 1-3 vezes por semana
- d) 4 ou mais vezes por semana
- e) Todos os dias

14. Quando tem um problema de saúde, recorre a alguns dos seguintes? Selecione todas as opções que se aplique:

- a) Medicina Tradicional Chinesa/Indiana
- b) Medicina Ocidental
- c) Auto-Medicação
- d) Nenhum

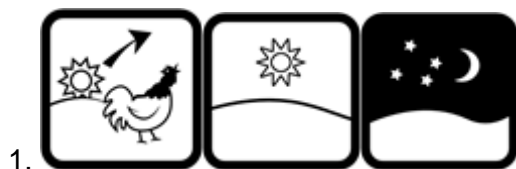
14.1 Se selecionou a opção c, na alínea anterior, onde costuma obter os medicamentos?

- a) Farmácia
- b) Internet
- c) Outro _____

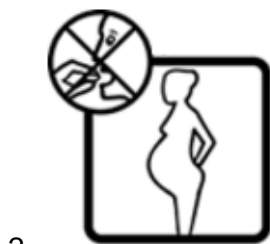
Secção 2: Pictogramas

Pedimos agora que em cada uma das perguntas seguintes, assinale por favor a alínea que considere que melhor descreve os desenhos/imagens/ilustrações respetivos.

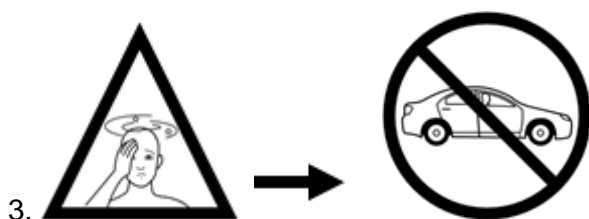
Muito obrigado! आपको बहुत बहुत धन्यवाद! 非常感謝!



- a) Tome de manhã, ao meio-dia e à noite
- b) Tome ao pequeno almoço, ao almoço, e ao jantar
- c) Tome este medicamento de manhã, à tarde ou à noite



- a) Ter atenção desta medicação nas mulheres grávidas
- b) Repouse depois de tomar o medicamento
- c) Não tome este medicamento durante a gravidez



- a) Não conduza durante o tratamento com este medicamento
- b) Se tiver tonturas após a toma deste medicamento, não conduza
- c) Este remédio pode afetar a vista



4.

- a) Tome com o estômago vazio
- b) Não tome este medicamento de barriga vazia
- c) Tome este medicamento à refeição



5.

- a) Guarde este medicamento num local fresco
- b) Guarde o medicamento no frigorífico
- c) Guarde este medicamento no congelador



6.

- a) Mantenha o medicamento fora do alcance das crianças
- b) Evite a toma deste medicamento por crianças
- c) Crianças não podem tomar este medicamento sozinhas.



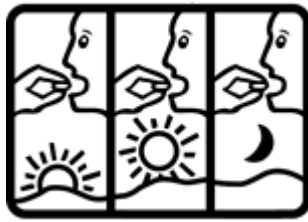
7.

- a) Não tome o medicamento com o álcool
- b) Não beba bebidas alcoólicas depois de tomar este medicamento
- c) Não beba bebidas alcoólicas durante o tratamento com este medicamento



8.

- a) Tome o comprimido inteiro
- b) Não quebre ou esmague os comprimidos nem abra as cápsulas
- c) Não dissolva o medicamento.



9.

- a) Tome este medicamento ao pequeno almoço, ao almoço, e ao jantar
- b) Tome este medicamento de manhã, à tarde ou à noite
- c) Tome este medicamento 3 vezes ao dia



10.

- a) Ter atenção desta medicação nas mulheres amamentar
- b) Se estiver a amamentar, não tome este medicamento
- c) Tome o medicamento após a amamentação



11.

- a) Tome este medicamento antes da refeição
- b) Tome o medicamento após a refeição
- c) Tome este medicamento junto com alimentos



12.

- a) Aplique este medicamento no ânus
- b) Insira este medicamento na vagina
- c) Insira o supositório

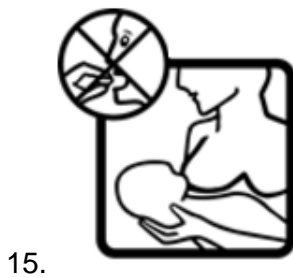


13.

- a) Não tome este medicamento com alimentos
- b) Tome este medicamento fora das principais refeições
- c) Não coma depois de tomar o medicamento



- a) Tome este medicamento se tiver dificuldade em adormecer
- b) Não tome este medicamento quando estiver com sono
- c) Este medicamento pode causar fadiga/sonolência



- a) Não tome este medicamento se estiver a amamentar
- b) Ter atenção desta medicação nas mulheres amamentar
- c) Tome o medicamento após a amamentação



- a) Não beba bebidas alcoólicas durante o tratamento com este medicamento
- b) Não tome este medicamento com bebidas alcoólicas
- c) Não beba bebidas alcoólicas depois de tomar este medicamento



- a) Desinfete sempre as mãos quando aplica o medicamento no ouvido
- b) Lava as mãos antes e após aplicação deste medicamento no ouvido
- c) Aplique apenas uma gota do medicamento



18.

- a) Evite a toma deste medicamento por crianças
- b) Não ande ou faça exercício depois de tomar o medicamento.
- c) Manter este medicamento fora do alcance das crianças



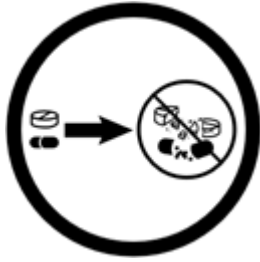
19.

- a) Guarde este medicamento num local fresco
- b) Guarde este medicamento no frigorífico
- c) Guarde este medicamento no congelador



20.

- a) Agite este medicamento antes de usar
- b) Não aperte o frasco
- c) Segure com força durante agitação



21.

- a) Não quebre ou esmague os comprimidos nem abra as cápsulas
- b) Pode tomar o comprimido fracionado em pequenas partes ou cápsulas abertas
- c) Não dissolva o medicamento



22.

- a) Ter atenção desta medicação nas mulheres grávidas
- b) Repouse depois de tomar o medicamento
- c) Não tome este medicamento durante a gravidez



23.

- a) Tome este medicamento antes da refeição
- b) Tome este medicamento junto com alimentos.
- c) Tome o medicamento depois da refeição



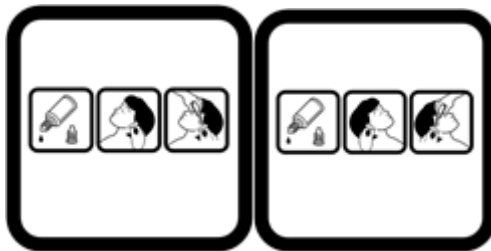
24.

- a) Misture o medicamento em água
- b) Ingira muita água após a toma deste medicamento
- c) Ingira este medicamento com um copo de água extra



25.

- a) Não aperte o frasco
- b) Agite bem este medicamento antes de usar
- c) Segure com força durante agitação



26.

- a) Despreze a primeira gota, antes de aplicar em cada ouvido
- b) Aplique uma gota em cada olho
- c) Aplique uma gotas deste medicamento no ouvido esquerdo e outra no ouvido direito



27.

- a) Lave bem as mãos antes e após a sua aplicação na vagina
- b) Lave as mãos antes de aplicar o supositório
- c) Desinfete as mão quando aplica o medicamento na vagina



28.

- a) Tome este medicamento quando tiver sono
- b) Este medicamento pode causar sonolência
- c) Não tome este medicamento ao deitar



29.

- a) Se tiver tonturas com a toma deste medicamento, não conduza
- b) Não conduza durante o tratamento com este medicamento
- c) Não conduza após tomar este medicamento



30.

- a) Tome o medicamento, dispersando o conteúdo na água (em suspensão)
- b) Misture o medicamento em água
- c) Ingira este medicamento com água

Secção 3: Questões adicionais

Por favor, responda brevemente as seguintes questões.

1. Alguma vez recebeu uma imagem ou ilustração como aquelas que viu nas páginas anteriores?

- a) Sim
- b) Não

1.1. Se sim, em que situação?

- a) Medicação crónica
- b) Medicação de uma situação aguda
- c) Outro: _____

1.2. Qual era o problema de saúde? _____

1.3. Onde (local)?

- a) Farmácia
- b) Hospital
- c) Outro: _____

2. Se respondeu “Sim” na pergunta anterior, quem forneceu a imagem ou ilustração?

- a) Médico
- b) Farmacêutico
- c) Enfermeiro
- d) Outro: _____

3. . Considera as imagens ou ilustrações úteis para a correta utilização dos medicamentos?

- a) Sim
- b) Não

Por favor, justifique a sua resposta

4. Tem algum outro comentário, sugestão ou crítica? _____

5. Numa escala de 1 a 5, sendo um “Não achei o questionário nada relevante” e 5 “Achei o questionário extremamente relevante” qual é o seu grau de satisfação em relação a este inquérito?

- a) 1
- b) 2
- c) 3
- d) 4
- e) 5

FIM

Muito Obrigado! आपको बहुत बहुत धन्यवाद! 非常感谢!