

## Medication Errors Related to Look Alike and Sound Alike Medications: About a Moroccan City University Hospital and Community Pharmacies Experience

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### Abstract

### Original Research Article

Medication errors are a problem that has always threatened the well-being of patients, in our study we will highlight one of the most common causes, it is the Look Alike and Sound Alike medications that can contribute to up to 25% of all medication errors and harm about 250,000 people a year. Also causes several difficulties for health professionals, either in hospitals or in pharmacies. This is a descriptive and analytical cross-sectional study with health professionals in pharmacies and hospitals, which took place between 2022/02/22 and 2022/08/11, in the form of an anonymous questionnaire, The statistical study was carried out with the Jamovi software and Microsoft Excel. One hundred and thirty four responses were received, divided between 71 for pharmacies and 63 for hospitals, targeting services with a high workload. A percentage of 87% of participants from pharmacies confirm that they are already confronted with medicines with similarities either at the level of packaging or at the nomenclature, 71% of hospital participants also confirm it, and among all participants 58% are already facing medication errors caused by these types of drugs. Our study can confirm that the problem of Look Alike and Sound Alike drugs is as always a serious problem, which needs more vigilance at the different levels of drug use, there are also international recommendations issued to minimize the risk of these medications.

**Key words:** Medication errors, Look Alike, Sound Alike, pharmacists, doctors.

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## INTRODUCTION

Medication errors occur during the prescribing, dispensing or administration of the wrong medication or dose ; these are the most common cause of adverse events and account for up to 19% to 20%. % [1]. According to the American Academy of Medicine, medication errors affect approximately 1.5 million people in the United States each year [2]. Nationally, the Anti-Poison and Pharmacovigilance Center of Morocco (CAPM) received 3,317 cases of adverse effects in 2017 ; Among them, 88% (2919) were declared by healthcare professionals and 12% (398) by patients. Furthermore, 23.7% of cases received (786) were linked to medication errors and irrational use of medications [3].

Look Alike Sound Alike (LASA) medications are medications that share a similarity in primary and/or

secondary or spelling packaging (same writing and therefore same pronunciation). The term LASA is most often used in Anglo-Saxon terminology. Berman broadly described medication errors (LASA) as responsible for thousands of deaths and costing millions of dollars each year in the United States: more than 25% of all medication errors are attributed to medication confusion. names and 33% to packaging or labeling [4]. Historically, the first LASA drug list warning of the possible risk of confusion following the use of these drugs was published in 1969 [5].

Studies in the United States have estimated that confusion caused by Look Alike Sound Alike (LASA) medications can contribute to up to 25% of all medication errors and harm 250,000 people per year [6].

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In 2011, the Pharmaceutical Services Division of the Ministry of Health Malaysia received a total of 5,003 reports of avoided accidents and medication errors through its error reporting system. Approximately 6% of reports were associated with similar medications [7].

In a more recent example in 2016, the United States Food and Drug Administration (FDA) changed the name of the antidepressant Brintellix (vortioxetine) to Trintellix, due to 55 reports of confusion with the anticoagulant Brilinta (ticagrelor) with 2 documented incidences of serious adverse effects [8].

Of all the events causing harm to patients in the UK, medication errors are the most common. Between January and March 2018, they accounted for 10.7% of incidents (206,485 medication incidents out of a total of 1,936,812 incidents) and 63 deaths and LASA medication errors represent a high proportion of all drug error estimates. medication ranging from 6.23 to 14.7%, which poses a significant threat to patient safety [9].

There are several recommendations made to minimize the risk of Look Alike and Sound Alike medications that may target people or systems and include reducing interruptions or distractions during medication administration, typographical adjustments, such as capitalization Selective (Tall Man Lettering) or bold type, barcodes and computerized entry of doctors' orders.

The main objective of this study is to present the difficulties encountered by healthcare professionals within the Mohamed V Military Instruction Hospital in Rabat (Morocco) related to Look Alike and Sound Alike medications.

This will subsequently make it possible to develop fact sheets with examples of LASA medications existing in their hospital structure to raise awareness among our healthcare professionals.

## MATERIALS AND METHOD

This is a descriptive and analytical cross-sectional survey of healthcare professionals, which took place between February and August 2022.

Our study targeted different health professionals (nurses, doctors, pharmacists, technicians), working either at the Mohamed V military training hospital in Rabat (in hot wards with a large workload) or in pharmacies in pharmacy via an anonymous self-administered questionnaire sent by courriel or WhatsApp via Google Forms).

**The questionnaire, written in French, was composed of 4 parts divided into 14 questions exploring the following aspects:**

- The sociodemographic characteristics of the participating health professionals (practice environment, status, year of practice, gender).
- To Determine the proportion of professionals confronted with LOOK ALIKE or SOUND ALIKE medications.
- To Determine the proportion of participants already faced with a medication error situation caused by Look Alike or Sound Alike medications.
- The solutions proposed by these health professionals.
- Data analysis was done using the Microsoft Excel spreadsheet and JAMOVI software.

## RESULTS

Out of a total of 235 questionnaires forms sent, we received 134 responses. The sample studied in our survey is composed of: 49 pharmacists (36,6%), 42 preparers (31,3%), 22 doctors (16,4%) and 21 nurses (15,7%) as indicated in the **Figure 1**. Community pharmacy staff represented 53% while 47% worked in hospitals. The M/F sex ratio was 1,06. The years of exercise of the participants in our study varied greatly, ranging from 1 year to 25 years with an average of 6,13.

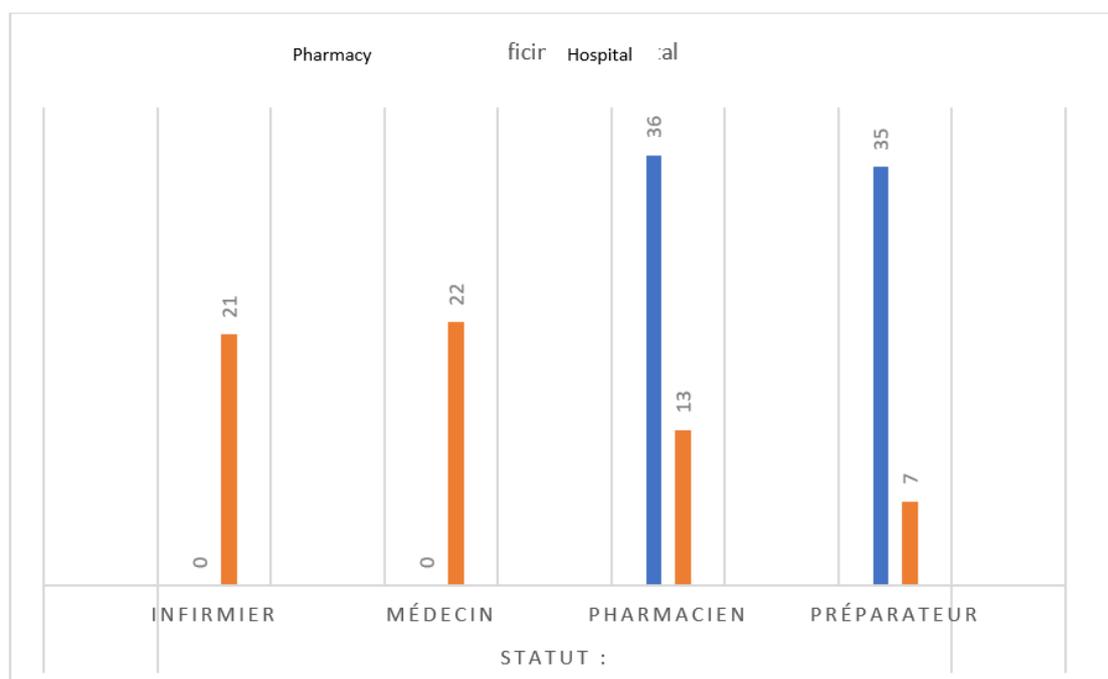
Among the 134 responses, a percentage of 58% of professionals are already faced with medication errors related to Look Alike or Sound Alike medications.

Also, we found 97 answers regarding medications that cause difficulties for healthcare professionals. Forty-four responses (37%) concerned the primary packaging, n = 96 (80.7%) concerned the secondary packaging and 4 responses (4.3%) concerned the product nomenclature.

The occurrence rate of events was recovered in four frequencies distributed as follows:

- Never : 7 responses or a percentage of 5.9%
- Rarely : 50 responses or a percentage of 42%
- Often : 61 responses or a percentage of 51.3%
- Always : 11 responses, a percentage of 9.2%

We have tried to summarize in **Table 1** the most probable causes from the point of view of the health professionals participating in our study. The different severities of the errors are presented using **Table 2**.



**Figure 1: Responses distribution according to each profession of the participants**

**Table 1: Probable causes of confusion**

The probable cause of the error	Unit	
	Pharmacy	Hospital
Workload	19	22
Dispensing error	42	11
Bad location	3	0

**Table 2: Errors severity**

Error severity	Unit	
	Pharmacy	Hospital
Catastrophic (irreversible impact)	1	2
Critical (reversible impact)	6	5
Major (without personal injury)	24	11
Minor	11	12
Significant	23	12

We tried to assess whether participants have ever been confronted with drugs that sounded (Sound-alike) and/or looked similar (Look-alike), the frequency of this event to expose the severity of the problem. The results are presented as follows:

For participants who practice in community pharmacies, 87% of them have already been confronted with LASA medications, compared to 71% in hospitals, the percentage has been reduced.

We think that the difference between the two environments is because of the limited presence of specialties in the hospital environment compared to community pharmacies as well as the frequency of contact with medications, which can be explained more by the responses retrieved by question 9 "The frequency of this event:" where we find a dominance of the frequency "often" at the pharmacy level on the other

hand at the hospital level the frequency which dominates is "rarely".

We assessed at which levels the problem is posed, the answers are distributed as follows:

- At the community pharmacy level, 58 responses from participants blame secondary packaging as a source of confusion, compared to 13 responses in the hospital environment and for primary packaging, 9 responses at the pharmacy level and 35 responses for the hospital environment. This is explained by distribution at the hospital level which is done by units and not by boxes as in pharmacies.
- Four responses to the hospital environment levels find that the similar nomenclature is the cause of the confusion.
- Knowing that 80% of the responses combine between 2 levels of conditioning where the problem is posed, primary and secondary conditioning in 24

responses, also Secondary conditioning and nomenclature a single response at the hospital level.

Based on 97 responses from participants in our study, we were able to establish a list presenting the LASA medications that pose a problem for healthcare

professionals in different work environments (**Tables 3, 4**).

Several solutions were proposed by our participants (**Table 5**).

**Table 3: List of LASA medications at hospital level.**

<b>Look Alike</b>
Gemcitabine and Carboplatin
Furilan and adrenaline
Ado 1g / 850mg / 500mg
Adrenaline 1mg/ 0,5mg
Anafranil and Sintrom and Tegretol
Fluconazole et vfeed
Keppra 250mg / 500mg
Temgesic and ephedrine
Calcinib 5mg / 10mg
Gemcitabine with oxaliplatin
Paclitaxel and carboplatin
Noradrenaline and midazolam
Tobrex and maxidrol
Zidime and Zinoxime
Profenid and amikacin
Vfeed Cp et Lyrica Cp
Dobutamine with Mopral
Atropine and Atrovent
Lifter 50 and 100
<b>Sound Alike</b>
Vinblastine and Vincristine
Atropine and Atrovent

**Tableau 1: List of LASA medications at community pharmacy level.**

<b>Look Alike</b>
Coversyl and coveram
Holoxan and Endoxan
Ado 1g / 850mg / 500mg
Cardix 6.25mg/25mg
Anafranil and Sintrom and Tegretol
Paroxetine Win and metformin Win
Ludiomil and esidrex and cataflam
Vigorex 50mg/ 100mg
Calcinib 5mg / 10mg
Valphi 160mg / 80mg
Sintrom and tegritol and Anafranil
Ear spectrum and Spectrum eye drops
Tobrex and maxidrol
Dicynon 250 mg / 500mg
Anginib 100 / 50mg
Clamoxyl 1g / 500mg
Irphi 75mg / 150mg
D-cure ampoule et d-cure fort
Dipicor 5mg / 10mg
Cataflam and ludiomil and diovan
Alomide and ciloxan
Lifter 50 and 100
Diprosone et Diprosalic
Paroxetine Win and Metformin Win and Ramipril Win

<b>Sound Alike</b>
Askardil et Ascabiol
Nodep et nolip
Dulastan et Duspatalin

**Table 5: Solutions offered by our healthcare professionals.**

Packaging change
Double check
Computerized prescriptions
Pay attention to storage
Make writing more readable on tinted bulbs
Make significant differences on primary conditioning
Avoid overwork, have a sufficient number of staff
Continuing training for staff
Never allow student trainees to administer medications
Geographic separation of drugs look alike
Pay attention to the drugs dispensation
Place Look Alike or Sound Alike medications on different shelves.
Check before use (look alike)
Instructions must be written (Sound alike)
Signaling of this medication type
Check well before each dispensation: Take into account the possibility of confusion between one article and another, you must therefore ensure the exterior packaging and review it carefully
Manufacturers need to take this problem into account and change the colors of the boxes
Have registered boxes for medicines
Mandatory reporting of every incident, even small ones, to the CAPM, and if the error occurs in different locations at a significant rate, it will do what is necessary to remedy the problem
Loading of the packaging Check by the DMP of this type of similarities
Double check before dispensing by the preparer and the nurse before administration
Good quality and effectiveness of this product
Communicate any incident of this type to raise awareness among manufacturers of the risks linked to look like
The DMP must require manufacturers to use different packaging
Use the international Nonproprietary name
Change the writing, shape, volumes, etc. of similar bulbs

## DISCUSSION

Medication errors can have serious consequences for patients and healthcare professionals, thus contributing to the extension of duration of hospitalization. The human factor increases the incidence of these errors [10].

Understanding medication errors makes it possible to establish measures and procedures to reduce their appearance. nevertheless, a study carried out by Leaped et al demonstrated that most medication errors go unnoticed, and that only significant events are reported [11].

In 134 responses from participants in our study 70 participants with experience of less than 5 years, if we consider that these participants present a percentage of 100% therefore according to the results cited in the table above we observed that just 68% having been exposed to LASA medications. For the 64 (100%) participants with more than 5 years of practice, we observe that the percentage is increased to 92%.

A direct correlation between the years of practice of the professionals and the percentage of participants having been confronted with LASA drugs was observed between these two variables which increase jointly, this is explainable because those who have more experience are confronted with many more drugs which increases the chances of having been confronted with LASA drugs.

Recommendations were shared by the American Society of Health System Pharmacists, the American Society of Clinical Oncology with the US Oncology Nursing Society to improve drug safety [12-13]. The guidelines contain: Use unambiguous packaging and labeling and use Tall Man Lettering to distinguish drugs that look or sound similar, using Modeled order sets with required fields.

The guidelines also suggested additional safety practices, including the use checklists, ban on verbal exchanges prescription, avoidance of ambiguities abbreviations, and establishing a no interruption rule when prescribing a medication or distribution.

Thus, the Recommendations for the Prevention of Medication Errors Related to LASA Medications were as follows:

Upstream of the care process:

- In terms of labeling, we can use the Tall Man Lettering (TML) system which makes nomenclatures likely to be a source of confusion more readable and visible.
- At the level of the AMM scientific commission of the Medicines and Pharmacy Department (DMP): evaluation of the spelling and phonetic aspect of the name of the specialty of the medicine in order to avoid any confusion with other medicines marketed in national level [14].
- At the hospital level, the medicines commission intervenes in the development of the nomenclature of medicines and can at its level delete all pharmaceutical specialties of similar sound or appearance.
- Separate storage of medications with a high risk of confusion and affix an additional label to the packaging when the latter is considered insufficient.
- Improving writing and computerization through the use of electronic prescriptions.

During the care process:

- Adopt the principle of medicine double control at the clinical service (at the time of receipt of medicines from the pharmacy and before its administration to the patient) and at the pharmacy before medicines distribution.
- Raise awareness and train all health professionals through sheets containing a list of LASA medications present in the hospital structure.

## CONCLUSION

According to our results analysis, nearly 80% of the participating healthcare professionals have already been confronted with Look Alike or Sound Alike medications, despite their different practice years and their different working environments. Also, concerned about creating a brand image, pharmaceutical industries can be a direct cause in the creation of similar drugs in terms of nomenclature or in terms of packaging at these different levels, which increases the risk of confusion and consequently the medication errors occurrence, these problems can be minimized by more control at the Medicines and Pharmacy Department (DMP).

Accepting that, certain similarity degree will always exist between drug names and packaging. We can note that all medical errors have a "human" element, such as (making assumptions, not properly hearing or visual control and distractions related to fatigue and/or a busy work environment). These types of Errors should not occur in ideal work practices.

Human factors associated with errors were explored using psycholinguistic principles revealing interesting phenomena regarding how the brain records, processes and stores words (drug names) and images (package shapes and features) and how variations Police and environmental influences (interruptions) can influence these processes.

Now, in collaboration with informaticists, several electronic initiatives have resulted in a number of practice-based recommendations that can be used individually or as part of a multi-faceted approach to reduce the risks associated with use LASA medications.

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