

Single Center Look Alike and Sound Alike Medication Experience

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Abstract

Errors in treatment due to similar Look-alike Sound-alike (LASA) medications are increasing worldwide. Distinct medication shares similar characteristics including shape, spelling, phonetics, and packaging. Determination of patient's experiences on LASA medication may be a significant factor to improve safety and reduce the chances of negative complications. Therefore, the current study aims to assess the experience and correlation between descriptive characteristics of the patients on LASA medications. A descriptive study based on validated questionnaire was conducted at Prince Saud Bin Jalawi hospital. A total of 148 Patients participated, who visited the hospital for follow up check up in Medical, Dermatology, Cardiology and Neurology clinics from May 2024 to July 2024. The questionnaire was filled by participants: age range from 18 to ≥ 50 year with mean 35.4 ± 11.9 year. Gender distribution was 95 females (64%) and male 53 (35.8) with male to female ratio 1:1.7. Looking to job of patient we have 16% student, 16% Health care worker, 3% nonspecific and 8 % retired. From education level 23% primary level, 26% secondary level, and 60 % has university education. In conclusion, the current study showed that one out of each four patients had medication error due to LASA for 1-5 times. Look-alike tablets or caps and packaging look alike were the most repeated factors behind the error where the study discovered that some patients reported side effects after committing LASA errors. The current suggests that the pharmacist should educate and explain the medication properly to patient, which will reduce the LASA errors and associated side effects.

Keywords: Labelling, Patients' Awareness, Medication Error, Sound Alike, Look Alike

1. Introduction

A "Look Alike and Sound Alike" (LASA) refers to a medication that are similar in appearance like in shape, spelling, phonetics, and packaging [1]. Therefore, sharing prominent similarities causes confusion to prescribers, pharmacists, nurses, and patients [2]. LASA medications are reported to cause harm in the United Kingdom's patients. For example, around 10.7 % of incidences were reported, which makes 2,06,485 out of 19,36,812 medication incidents and 63 deaths were noted [3]. A high proportion of LASA errors are reported highly among all medication errors; LASA errors range from 6.23% to 14.7% [4]. The risk of improper medication, like LASA, is a considerable concern in the treatment of patients with mild as well as chronic symptoms. Previously shown that 19% of errors in 200 prescribed medications were caused by LASA medication [5]. Healthcare professionals reported that 37.3% of error incidences occurred in LASA medications [6]. Researchers have also reported that three cases of insidious medication errors were caused by LASA [7]. Another study reported that 35 out of 400 incidences were caused by LASA medications [8]. The Food and Drug Administration (FDA) has also reported various accrued

events in terms of LASA medication [9].

The incidences of LASA are common in treatment at hospitals or home-based treatment [10]. Several factors have been reported that lead to LASA incidents, considering the example of appearance. In this context, a study reported that medication appearance, look-like tablets were 28%, boxes were 20% and blisters packaging were 13% [11]. Another study reported that confusion due to drug name was 64.62 %, packaging confusion accounted for 24.62 %, and similar appearance accounted for 10.77 % of errors, indicating a considerable health concern associated with LASA [12]. One of the most practiced techniques to prevent the LASA error and its associated confusion is to educate and spread awareness among the health care professionals, pharmacists, and, if possible, patients as well [13]. Therefore, hospitals and emergencies implement policies and procedures to reduce the errors associated with LASA medications [14]. Strategies including the use of Tall man letters or boldface letters in names of drugs, labeling and identification of color coding, barcoding, and computerized physician order entry, appropriate font size and safety storage strategies, and specific

places to keep medicine in order can reduce the possibility of errors in LASA medications [1,15-18]. LASA medication errors are causing mild chronic harm in patients across the globe, for example, the United States (US), China, Thailand, and the Kingdom of Saudi Arabia (KSA) [12,19-21]. Therefore, proper education is required to reduce LASA- associated errors in proper labeling and storage. Whereas a number of cases were reported in KSA about LASA errors. However, the current study will emphasize LASA medication and, more specifically proper labeling and storage in Prince Saud bin Jalawi Hospital at Al-Ahsa, KSA.

2. Materials and Methods Study Design

A descriptive study based on structured and validated Questionnaire was conducted at Prince Saud Bin Jalawi from May 2024 to July 2024.

2.1 Study Setting

The current study was conducted at Prince Saud Bin Jalawi from May 2024 to July 2024.

2.2 Sampling

The questionnaire was distributed among the patients (n=148), who visited for follow-up care in different wards of the hospital, like Medical, Dermatology, Cardiology, and Neurology. Patients with follow-up visits in Medical, Dermatology, Cardiology, and Neurology clinics at Prince Saud Bin Jalawi. A sample size calculator (<http://www.raosoft.com/samplesize.html>) was used to estimate the sample for the current study. The calculator estimated the samples for the current study with a confidence interval of 95%.

3. Data Collection

The data from patients was collected after consent approval of

participation. The study protocols were shared with the patients in a face-to-face interview from May to July 2024. After that, a developed questionnaire of demographic data and patient’s experiences with LASA medication was shared with patients. A pilot study of n=12 patients was conducted following a similar protocol and excluded from the current study.

4. Statistical Analysis

Statistical Package for Social Sciences version 26 (SPSS, Ver: 26) was used to analyze the data for the current study. The relationship between patients' knowledge and experience with LASA medication using Pearson Chi-Square test and exact probability test for small frequency distribution data were used. All statistical methods used were two-tailed with an alpha level of 0.05, considering significance if P-value was less than or equal to 0.05. This study was carried out at Prince Saud Bin Jalawi hospital at Al Ahsa.

5. Results

A total of 148 eligible patients of different ages, education levels, and job nature were included, as shown in Table 1. Age ranges from 18 to ≥ 50 years (mean age of 35.4 ± 11.9 years). Among these patients, 95 (64.2%) were females, and 17 (11.5%) were workers from health care centers. Where work is further categorized into not working 35(36.8%), students 15 (15.8%), HCWS 15 (15.8%),other jobs 12 (12.6%), and retired 8(8.4%). When considering education level: 35 (23.6%) were student of below secondary level, 39 (26.4%) secondary level students, and 74 (50%) of university level or above students. A total of 85 (57.4%) patients were at medicine clinic, 29 (19.6%) from dermatology clinic, 25 (16.9%) from neurology clinic and 9 (6.1%) from cardiology clinic.

Personal characteristics	No	%
Age in years		
18-39	75	50.7%
40-49	32	21.6%
50+	41	27.7%
Gender		
Male	53	35.8%
Female	95	64.2%
Medical filed work		
Yes	17	11.5%
No	131	88.5%
Field of work		
Not working	35	36.8%
Student	15	15.8%
Government Employee	6	6.3%
Private Employee	4	4.2%
HCW	15	15.8%
Others	12	12.6%

Retired	8	8.4%
Educational level		
Below secondary	35	23.6%
Secondary education	39	26.4%
University / above	74	50.0%
The patient clinic		
Medical Clinic	85	57.4%
Dermatology Clinic	29	19.6%
Neurology Clinic	25	16.9%
Cardiology Clinic	9	6.1%

Table 1: Personal Characteristics of Study Patients at Prince Saud Bin Jalawi, Al-Ahsa, Saudi Arabia (n=148)

Table 2 shows the Medication history and drug dispensing among study patients. The results showed that 132 (89.2%) were using self-medication. A total of n=58 (39.2%) were receiving consultations of medications from virtual clinics. Where n=96 (64.9%) patients received the same medication for 1-4 years, and

34 (23%) received the same medication for more than 10 years. A total of n=122 (82.4%) received 2-4 drugs daily, and 26 (17.6%) received more than 4 drugs daily where a total of n=139 (93.9%) store their medications in one place.

Drug dispensing and medication history	No	%
Who dispensary and received patient medication?		
Patient himself	132	89.2%
Care giver	16	10.8%
Is there communication with you through a virtual clinic regarding drug consultation?		
Yes	58	39.2%
No	90	60.8%
Total years of received the same medication		
1-4 years	96	64.9%
5-10 years	18	12.2%
> 10 years	34	23.0%
Number of different medications taken daily?		
2-4 drugs	122	82.4%
> 4 drugs	26	17.6%
Is your storage medication in one place?		
Yes	139	93.9%
No	9	6.1%

Table 2: Medication History and Drug Dispensing Among Study Patients, at Prince Saud Bin Jalawi, Al-Ahsa, Saudi Arabia (n=148)

Table 3 shows the study patients' experience with LASA medication. A total of 36 (24.3%) patients received the wrong LASA medication 1-5 times (80.6%). Among those who experienced LASA, 16 (43.2%) discovered the medication error by LASA tablets or caps, 15 (40.5%) by packaging LASA, 4 (10.8%) by alike names, and 2

(5.4%) had look-alike drugs. Considering the time of discovering the error, medication was taken for 17 (45.9%), at home (29.7%), during dispensary from the pharmacy (10.8%), but 13.5% discovered side effects after taking medication.

LASA experience	No	%
Did you receive wrong look-alike and sound-alike medication?		
Yes	36	24.3%
No	99	66.9%
I cannot remember	13	8.8%
If yes, how many times?		

1-5 times	29	80.6%
> 5 times	7	19.4%
How discovered that medication is an error		
Look-alike tablets or caps	16	43.2%
Packaging look-alike	15	40.5%
Sound alike names	4	10.8%
Strips look-alike	2	5.4%
Time that you discover look alike and sound alike medication		
During dispensary from pharmacy	4	10.8%
At home	11	29.7%
During take medication	17	45.9%
After take medication and side effect occurred	5	13.5%

Table 3: Study Patients Experience with Look Alike Sound Alike Medication, Prince Saud Bin Jalawi, Al-Ahsa, Saudi Arabia (n=148)

Table 4 shows the factors associated with patients' experience with LASA medication. A total of 33.3% of secondary education patients experienced LASA versus 17.6% of university-level patients with a recorded statistically significant ($P=.047$). Also, LASA medications were experienced by 44.4% of patients at Cardiology

Clinic, 32% of patients at Neurology Clinic compared to 10.3% of patients at Dermatology Clinic ($P=.047$). Likewise, LASA was reported among 25.2% of patients stored medications in one-place in comparison to 11.1% of others who did not ($P=.049$).

Factors	Did you receive wrong look-alike and sound- alike medication?				p- value
	Yes		No		
	No	%	No	%	
Age in years					
18-39	22	29.3%	53	70.7%	.210
40-49	8	25.0%	24	75.0%	
50+	6	14.6%	35	85.4%	
Gender					
Male	11	20.8%	42	79.2%	.450
Female	25	26.3%	70	73.7%	
Medical filed work					
Yes	3	17.6%	14	82.4%	.495^
No	33	25.2%	98	74.8%	
Educational level					
Below secondary	10	28.6%	25	71.4%	.048*
Secondary education	13	33.3%	26	66.7%	
University / above	13	17.6%	61	82.4%	
The patient clinic					
Cardiology Clinic	4	44.4%	5	55.6%	.047*
Dermatology Clinic	3	10.3%	26	89.7%	
Medical Clinic	21	24.7%	64	75.3%	
Neurology Clinic	8	32.0%	17	68.0%	
Who dispensary and received patient medication?					
Patient himself	33	25.0%	99	75.0%	.582^
Care giver	3	18.8%	13	81.3%	
Is there communication with you through a virtual clinic regarding drug consultation?					

Yes	18	31.0%	40	69.0%	.127
No	18	20.0%	72	80.0%	
Total years of received the same medication					
1-4 years	25	26.0%	71	74.0%	.797
5-10 years	4	22.2%	14	77.8%	
> 10 years	7	20.6%	27	79.4%	
Number of different medications taken daily?					
2-4 drugs	29	23.8%	93	76.2%	.734
> 4 drugs	7	26.9%	19	73.1%	
Is your storage medication in one place?					
Yes	35	25.2%	104	74.8%	.049*^
No	1	11.1%	8	88.9%	

Table 4: Factors Associated with Patients' Experience with Look Alike Sound Alike Medication

Table 5 shows the relation between patients' knowledge and experience with LASA medication. A total of 35% of patients had no explanations regarding LASA drugs and had no experience in dealing with LASA compared to 17% (P=.012). Also, 36.4% of patients with no LASA drugs labeled with clear text when they received experienced LASA versus 20.8% (P=.049).

Knowledge	Did you receive wrong look-alike and sound-alike medication?				p- value
	Yes		No		
	No	%	No	%	
Able to segregation between Look Alike-Sound Alike					
Yes	24	22.6%	82	77.4%	.448
No	12	28.6%	30	71.4%	
Are there any explanations regarding look-alike and sound-alike drugs, how to deal with them?					
Yes	15	17.0%	73	83.0%	.012*
No	21	35.0%	39	65.0%	
Are the look-alike and sound-alike drugs labeling with clear text when you received?					
Yes	22	20.8%	84	79.2%	.264^
No	4	36.4%	7	63.6%	
I didn't check	10	32.3%	21	67.7%	

Table 5: Relation Between Patients' Knowledge and Experience with Look Alike Sound Alike Medication

Figure 1 Shows the Patients' awareness of the LASA Medication. A total of 106 (71.6%) Patients Reported about the Differentiation Between LASA, 106 (71.6%) Reported that the LASA Drugs Labeling with Clear text After Receiving, and 88 (59.5%) Reported Explanations Regarding LASA drugs.

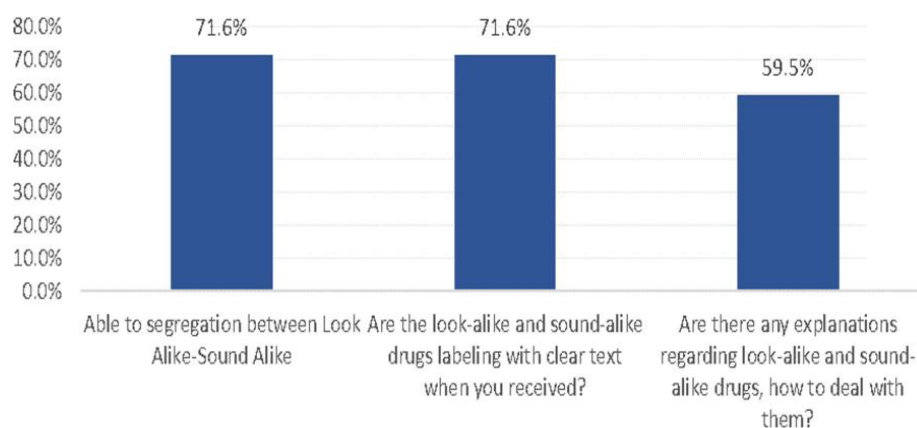


Figure 1: Patients' Awareness about Look Alike Sound Alike Medication, Prince Saud Bin Jalawi, Al-Ahsa, Saudi Arabia (n=148)

Figure 2 shows the patients' reported practice in noticing any side effects or adverse effects of LASA error. The most reported practices were, visiting the nearby hospital (43.2%), Instant

Medical Consultation Service (remote) through the (Sehhaty) app (27.7%), visited to the near by pharmacy (14.2%) where 14.9% reported to monitor symptoms.

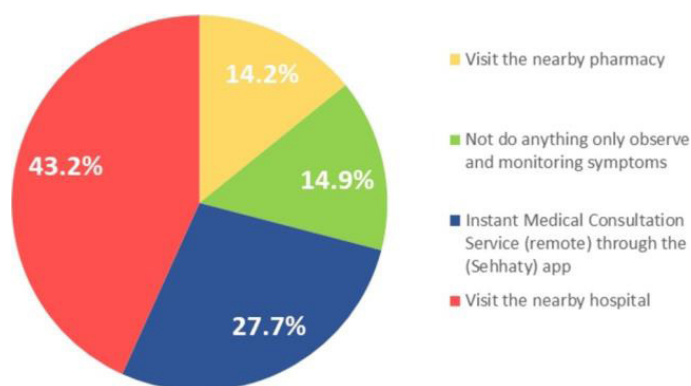


Figure 2: Patients' Reported Practice When They Notice Any of The Side Effects or Adverse Form Lasas Errors

7. Discussion

The current study showed that most patients were young and highly educated and mainly attended medical clinics. Medication history showed that most patients were using self-medications drugs where about two-thirds received the same medication for 1-4 years. Where a patients also taking 2 to 4 drugs daily and stored in the same place [1]. Furthermore, considering the medication errors caused by LASA, about one-fourth of the patients committed LASA medication errors mainly for 1 to 5 times. The factors include look-alike tablets or caps and look-alike packaging. Where 13% of the patients discovered side effects from taking LASA medications. Dermatology patients were well educated, therefore committed fewer errors in LASA medications, where no responses about the storage were provided but showed that higher errors were associated with lack of clear labelling on LASA medications.

Previous reported studies showed consistent findings where LASA and its associated medication errors rate was 19% [4]. Also, researchers documented that LASA related medication error rate ranged from 6.2% to 14.7% of patients [1]. A higher rate of incidence was reported by Alshammari, F. M. et al which was 37.3%. Another study showed the incidence of LASA medication 35 out of 400 incidences [6]. A much lower rate was found in study conducted by Shaw, K.N et al. (6%) and by Bundy, D.G et al. (15%) [4,22]. Another study assessed rate of 7% of medication near misses and 15% of vaccine errors [4,23]. LASA medications are a well-known source of errors during the treatment [1]. LASA Medication errors are a significant cause of patient harm where in severe conditions leads to death [24,25], these reports are also consistent with the current study's findings. Orthographic (look-alike) and phonetic (sound-alike) similarities between medications are the leading causes in confusion, and mistakes [1]. LASA error occurs at any stage, for example, prescribing, documenting, issuing, and administering [26,27]. Phonetic similarities include names, dosages, and/or strengths [26]. Orthographic medications are identical in terms of packaging, form, color, and/or size [6].

Previously reported studies showed that LASA medication error accounts for up to 25% of medication errors consistent with the assessed rate of the current study [2,11,28]. In Thailand, a study reported that about 2,510 pairs of LASA medications reported in different hospital, comprising 1,674 (66.6%) tablets/capsules, 427 injections (17.0%), and 85 liquid dosage forms (3.39%) [17]. Where LASA (phonetic) medication i.e. mercaptamine and mercaptopurine are prevalent in 0.00003 to 0.0022% among all the prescriptions in which 7% misses and 6.2%-14.7% medication errors are reported [1]. In addition, this current study showed that avoiding to store medications in one place, with a clear labelling, receiving explanations about medications from the pharmacists could reduce the LASA error rate and have a significant impact on accuracy of medication. This is consistent with the WHO and European pharmacology agencies recommendation to keep LASA medications physically apart from each other in order to lower the possibility of picking or selecting errors.

Psychology-wise, selecting a medication involves two different processes: picking the right thing and ignoring distractions [29]. Also, strategically organized shelves and storage areas can separate items with orthographically similar names, and this reduces the number of similar names [2]. Other studies recommended that medical personnel pronounce and/or spell the name aloud (probably prior to typing, handwriting, or administering it) in order to guarantee proper comprehension and help the name stick in the patient's working memory [2].

8. Conclusions

The current study concluded that one out of four patients had medication error due to LASA. Look- alike tablets or capsules and packaging look-alike were the most common factors behind the error. Where the current highlighted the significant findings and discovered that LASA errors in patients lead to cause side effects, which is harmful in certain situations. Also, suggests that education and explanation regarding LASA medication reduces the risk of error where emphasizing that storing medication in one place is a core reason for errors in LASA medications.

Additionally, the current suggests that labelling and separation of

drugs in dispensary needs to be improved to avoid errors in poorly educated patients.

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