EFFECTIVENESS OF DIGITAL TALL MAN LETTERS QR CODE IN THE COMMUNITY PHARMACIES IN KORONADAL CITY, SOUTH COTABATO

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ABSTRACT

Introduction: Pharmacists have a crucial role in healthcare, yet medication errors, often due to confusing drug names, are common. Sound-Alike Look-Alike Drugs (SALADs) pose risks, but Tall Man Lettering (TML) uses capital letters to highlight differences, helping pharmacists in distinguishing similar medications and preventing errors.

Method: A quasi-experimental design was used, and pharmacists were selected via purposive sampling and assigned to either the experimental group using the QR Code or the control group.

Results: The findings revealed that in post-intervention, knowledge (mean: 3.77), attitudes (mean: 3.79), and practices (mean: 3.57) showed an improvement compared with pre-intervention data. There was also a significant difference ($p < 0.05$) between control and experimental groups in knowledge, attitudes, and practices.

Conclusion: This research evaluated the effectiveness of Digital Tall Man Letters QR Code in City of Koronadal's community pharmacies. It concluded that Tall Man Letters are a highly effective intervention tool in helping community pharmacists differentiate Sound-alike Look-Alike Drugs.

INTRODUCTION

Across the world, healthcare professionals, such as pharmacists, work to treat patients when they are ill and help them maintain good health. Pharmacists are knowledgeable about medications. By providing free medical advice and medicines without an appointment, pharmacists serve as an intermediary between the patient and the physician. Traditionally, pharmacists have primarily worked in community pharmacies (Explore Health Careers, 2022). Based on Luchen, et al. (2021), community pharmacies are sometimes identified as retail pharmacies, operating from small to large chains. Pharmacists in the community setting are entrusted with confidential information and with the lives of their patients during all components of patient care that include the safety of medication administration because, generally, they are the first point of interaction with patients (Smith, et al., 2019).

Pharmacists are medical experts that are essential to many aspects of the healthcare system (First Arabian Drug Information Centre, 2020). Even though pharmacists are drug experts, sometimes they commit errors. One of the most frequent causes of medication errors is the presence of confusing medicine names. There are many various types of medication errors, misreading medication names

that look similar is one of them and it is a common mistake. These look-alike medication names may also sound alike and can lead to errors (Rahman, Z., June 2015).

The term SALADs (sound-alike look-alike drugs) are product packaging and drug names that are similar enough to cause misunderstanding and may result in potentially harmful medication errors. With these errors, tall man letters are employed within medicine names to highlight main differences and help distinguish look-alike names. Several studies have demonstrated that highlighting portions of words with tall man lettering can help distinguish similar drug names, and that employing tall man letters to separate items with similar names results in fewer errors (Irish Medication Safety Network, 2016).

The Institute for Safe Medication Practices (ISMP), The Food and Drug Administration (FDA), The Joint Commission, and other safety-conscious organizations such as the National Association of Boards of Pharmacy (NABP) have recommended the usage of tall man letters to reduce confusion between similar medicine names (Grissinger et al., 2012). According to an ISMP survey performed in 2008, most respondents appeared to agree that almost all of those responded to the survey (87%) agreed that the medical product industry's usage of tall man letters helped to reduce drug selection errors, and two-thirds (64%) said that tall man lettering prevented them from dispensing or administering the wrong medication. In addition to distinguishing portions of drug names that are dissimilar, according to the respondents, tall man letters are an effective alert system that immediately caught their attention causing them to pause and read the drug name carefully again.

The tall man lettering (TML) method makes use of capital letters to distinguish between similar-sounding medicinal names. The TML emphasizes the contrasts between identical drug names by emphasizing letters that differ, starting on the left side of a drug name. It can be used in conjunction with color or bolding to highlight the differences between similar-sounding drug names and warn medical professionals that the drug name might be mistaken for a further drug name. The FDA launched the name differentiation project in 2001 with the goal of continuously evaluating pharmacovigilance concerns of name pair confusion and deciding if TML should be applied to assist distinguish comparable established names. The FDA evaluates several variables, including the degree of name resemblance, safety hazards associated with name confusion, redundant product attributes, reports of wrong-drug errors, and causes or possible causes (Food and Drug Administration, 2020).

Recent technologies are ushering in a new era of health care that is fundamentally changing on how and where medical decisions are made and treatment is rendered through a combination of wearable health monitor technologies, especially with the use of QR codes. Quick response (QR) codes minimize the hassle associated with the process of issuing and storing paper prescriptions. (Lim, et al., 2013). There is a need to determine the effectiveness, that is the extent to which something is successful in achieving the desired outcome. That is to provide solutions and create a Digital Tall Man QR code for improving the accuracy and medical safety of patient medication administration. The use of tall man letters on computer-generated pharmacy labels was the most common, effective, and widely used; whereas, the use of letters on printed preorder forms was among the least common and least effective (Grissinger, et al., 2012).

METHODS

Study Design

The researchers used a comparison group type of quasi-experimental design utilizing the purposive technique. It focused on the effectiveness of digital tall man letters QR code to give knowledge and information among community pharmacists, for them to easily recognize the SALADS (sound-alike look-alike drugs). A quasi-experimental design was chosen because it helps to provide the researchers with better insights that can produce objective data that can be Population and identified based on non-random variables, subjects were divided into groups.

Sampling Technique

The researcher used purposive sampling in selecting the respondents of the study. However, the researcher selected their respondents from their sampling frame following the characteristics of the researcher's preferences. They began with the specific traits based on the inclusion and exclusion criteria that they wanted to examine. Purposive sampling aims to provide a sample that may be assumed to be representative of the population. It is frequently accomplished by using an expert knowledge about the population to select a sample of elements representing a cross-section of the population in a non-random manner. The participants of the study are the sixty (60) community pharmacists, specifically the independent drugstores within the City proper of Koronadal City, South Cotabato with work experience, employed in the independent community pharmacies within the city proper of Koronadal City, South Cotabato. The thirty (30) chosen community pharmacists are included in the experimental group with the inclusion criteria which are: (1) working in a community pharmacy; (2) has internet connection inside a community pharmacy; (3) licensed community pharmacist; (4) ages between 21 and 60; and (5) must have at least one year of work experience. The other thirty (30) chosen community pharmacists are included in the control group which has the same inclusion, but the subjects in this group are still accepted if internet connection is not available in their community pharmacy.

Research Instrument

The researcher used a self-made questionnaire, after a thorough review of the literature to the respondents of the Community Pharmacies in City of Koronadal, South Cotabato. The survey questionnaire was used to gather information about the effectiveness of digital tall man letters QR Code in the community pharmacies in City of Koronadal, South Cotabato. After making the questionnaire that is based on related studies, it will be validated by expert validator. To gather data from the participants, the researchers distributed the validated survey questionnaires. The rating scale of the questionnaire used the four-point Likert scale with responses to choices ranging from 4 which means Strongly Agree; 3 as Somewhat Agree; 2 as Somewhat Disagree; and 1 as Strongly Disagree that has a description equivalent that is based on the results-based performance management system implemented by the Civil Service Commission under the Memorandum Circular No. 6 series of 2012.

Data Collection

Phase One:

Researchers obtained clearance, validation, and authorization from respondents and authorities. They prepared survey questions and wrote permission letters to relevant entities. Questionnaires were created based on related studies and validated by expert validators. The Digital Tall Man Letters QR Code was developed with the help of an Information Technologist.

Phase Two:

Permission was obtained from various entities to conduct the study. Researchers coordinated with community pharmacies to select respondents and conducted a pilot study with 10 pharmacies. Following the pilot study, permission was sought from 30 community pharmacies for a control group study lasting one week. For the experimental group, one community pharmacy was chosen to use the Tall Man Letters QR Code. Questionnaires were given to 30 respondents.

Phase Three:

Participants were informed about privacy measures before the survey. Study objectives were discussed with participants, and survey questionnaires were distributed to gather data. Data were analyzed using Microsoft Excel and sent to a statistician for results.

Data Analysis

This research utilized both descriptive and inferential statistics to analyze data. Descriptive analysis, including frequency and percentage distribution, was used to collect data on age, gender, and years of work experience in community pharmacy. The mean and standard deviation were used to assess the effectiveness of Digital Tall Man Letters QR code among community pharmacists before and after the intervention regarding knowledge, attitude, and practice. An independent t-test determined if there was a significant difference in effectiveness before and after the intervention, as well as between pharmacy personnel with and without the intervention. Data were analyzed to address research problems, emphasizing responses with the highest values. Interpretation used a 4-point rating scale, translated into percentages and rankings for assessing the effectiveness of Digital Tall Man Letters QR code in community pharmacies in the City of Koronadal, South Cotabato.

RESULTS AND DISCUSSION

A. Demographic Profile

Table 1. Demographic Profile of the Respondents

Profile	Segmentation	f			Percentage Distribution		
		Experimental Group	Control Group	Total	Experimental Group	Control Group	Total
Age	21-30 years old	20	19	39	66.7	63.3	65.0
	31-40 years old	5	3	8	16.7	10.0	13.3

	41-50 years old	2	4	6	6.7	13.3	10.0
	51-60 years old	3	4	7	10.0	13.3	11.7
Gender	Female	22	22	44	73.3	73.3	73.3
	Male	8	8	16	26.7	26.7	26.7
Years of Current Employment	1-3 years	19	19	38	63.3	63.3	63.3
	4-6 years	7	4	11	23.3	13.3	18.3
	7-9 years	2	6	8	6.7	20.0	13.3
	10 years and above	2	1	3	6.7	3.33	5.0

In the experimental group, results indicated that most of the community pharmacies were at the age bracket of 21-30 years old (66.7%), Female (73.3%), and had 1-3 years of working experiences. Furthermore, the control group had the same result, but with a different percentage for ages 21-30 years old (63.3%). Total results of the survey also indicated that most of the community pharmacies were at the age bracket of 21-30 years old (65.0%), Female (73.3%), and had 1-3 years of working experiences.

B. **Level of Indicator**

Table 2. The Level of Effectiveness of Digital Tall Man Letters QR Code among Community Pharmacy Personnel Before and After Intervention

Knowledge	Before			After		
	Mean	**SD**	**Description**	**Mean**	**SD**	**Description**
Q1	2.73	0.828	High	3.77	0.430	Very high
Q2	2.87	0.819	High	3.77	0.430	Very high
Q3	2.97	0.850	High	3.77	0.430	Very high

Q4	2.90	0.759	High	3.80	0.407	Very high	
Q5	2.70	0.952	High	3.77	0.430	Very high	
Overall mean	**2.83**	**0.691**	**High**	**3.77**	**0.314**	**Very high**	
Attitudes							The re-sults showed that the level of
Q1	3.17	0.699	High	3.77	0.430	Very high	
Q2	3.07	0.691	High	3.90	0.305	Very high	
Q3	2.77	0.774	High	3.80	0.407	Very high	
Q4	2.57	0.774	High	3.83	0.379	Very high	
Q5	2.63	0.718	High	3.77	0.430	Very high	
Q6	2.73	0.640	High	3.60	0.498	Very high	
Q7	3.13	0.629	High	3.87	0.346	Very high	
Overall mean	**2.87**	**0.445**	**High**	**3.79**	**0.256**	**Very high**	
Practices							
Q1	2.77	0.817	High	3.57	0.504	Very high	
Q2	2.37	0.765	High	3.33	0.606	Very high	
Q3	2.80	0.610	High	3.67	0.479	Very high	
Q4	2.53	0.819	High	3.47	0.571	Very high	
Q5	3.13	0.776	High	3.80	0.407	Very high	
Overall mean	**2.72**	**0.522**	**High**	**3.57**	**0.311**	**Very high**	

knowledge among respondents has substantially increased post intervention with Digital Tall Man Letters QR Code in the Community Pharmacies. On a similar note, the level of attitudes and practices increases to mean value of 3.79 and 3.57 respectively as compared to data prior to Digital Tall Man Letters QR Code in the Community Pharmacies intervention. The interpretation matrix in this study is shown below:

MATRIX OF INTERPRETATION

Mean interval	Category
1 – 1.75	Very Low
1.76 -2.50	Low
2.51 – 3.25	High
3.26 -4.0	Very High

* Wibowo & Suyatmi, 2016

C. Inferential Statistics

To determine the efficacy of Digital Tall Man Letters QR Code in the Community Pharmacies, statistical analysis was conducted and results are shown in tables 3 and 4.

Table 3. Testing the Significant Difference in the Level of Effectiveness Before and After the Digital Tall Man Letters QR Code Intervention

Test Variables		T value	P value	Remarks*
Knowledge	Before	18.9006	0.0001	Significant
	After			
Attitudes	Before	10.5664	0.0001	Significant
	After			
Practices	Before	16.1006	0.0001	Significant
	After			

*Calculation was performed at 0.05 level of significance

The statistical analysis showed that there was an existing significant difference (p<0.05) between the pre-test and post-test results on the level of knowledge, attitudes and practices among community pharmacies in the use of Digital Tall Man Letters QR Code. This means that the Digital Tall Man Letters QR Code is an effective intervention tool.

Table 4. Testing the Significant Difference in the Level of Effectiveness With and Without The Digital Tall Man Letters QR Code Intervention

Test Variables		Mean±SD	T value	P value	Remarks*
Knowledge	With	3.78±0.0134	4.3844	0.0118	Significant
	Without	3.11±0.3298			
Attitudes	With	3.79±0.0975	6.67	0.0006	Significant
	Without	2.65±0.4835			
Practices	With	3.57±0.1806	4.74	0.0090	Significant
	Without	2.26±0.7049			

*Calculation was performed at 0.05 level of significance

The statistical analysis showed that there was an existing significant difference (p<0.05) between control and experimental groups on their level of knowledge, attitudes and practices among community pharmacies after the intervention of Digital Tall Man Letters QR Code. This means that the Digital Tall Man Letters QR Code is an effective intervention tool.

Conclusion

This research was conducted to evaluate the Effectiveness of Digital Tall Man Letters QR Code in the Community Pharmacies in Koronadal City, South Cotabato. This study enables the researchers to determine the significant difference between community pharmacists before and after, with and without the digital tall man letters QR code intervention and to determine the effect size of digital tall man letters QR code based on the community pharmacists after the intervention. The final findings showed the level of use of the effect size to determine the effectiveness of Digital Tall Man Letters QR Code intervention on community pharmacists. It was clearly stated that the intervention is highly successful in using the QR Code. In addition, there is a significant difference between the before and after intervention of community pharmacists and with and without the intervention in terms of their knowledge, attitude and practice. However, the final results for the group that did not get any kind of intervention had little to no difference. Moreover, it might be assessed that the intervention group had made more significant progress. In conclusion, the effectiveness of Digital Tall Man Letters QR Code in the community pharmacies in Koronadal City, South Cotabato, based on the knowledge, attitude and practice of community pharmacists has a description of very high, which means that the gathered data based on the overall results claim that the Digital

Tall Man Letters QR Code is highly effective intervention tool to help community pharmacists give information about Sound-alike Look-Alike Drugs.

Acknowledgement

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