



INDO AMERICAN JOURNAL OF PHARMACEUTICAL RESEARCH



KNOWLEDGE, ATTITUDE AND PRACTICE ASSESSMENT OF DRUG DISPENSERS TOWARDS DRUG PRODUCTS STABILITY AT DRUG OUTLETS IN JIMMA TOWN: A CROSSECTIONAL STUDY

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ARTICLE INFO

Article history

Received 03/03/2020

Available online

30/05/2020

Keywords

Knowledge,
Attitude,
Practice,
Drug Stability,
Dispensers.

ABSTRACT

Background: Aspects of drug product stability are of primary concern to dispensers in the dispensing of drugs at drug retail outlet. Therefore, this study assessed knowledge, attitude and practice of drug dispensers towards drug product stability at community pharmacies in Jimma town. Method: Cross-sectional study was conducted on total of 19 dispensers from Jimma private drug outlet (n=19) in Jimma town from January to June 2019. Data on knowledge, attitude, practice of dispensers towards drug stability, and sociodemographic characteristics of respondents were collected using a structured interviewer administered questionnaire. Data was analyzed by using SPSS Version 21.0 (Chicago, SPSS Inc.). The Chi square test was used to determine association between practice of maintaining drug stability through proper storage condition among respondents and sociodemographic characteristics of dispensers. Results: A total of 19 dispensers were included in this study, 13(68.4%) of the dispensers was males and mean age was 47±13 years. Thirteen (68.4%) were pharmacists and 5(26.3%) were pharmacy technicians (druggists). Twelve (63.2%) of drug dispensers revealed stability of drugs product as critical element in pharmaceutical regulatory system. Majority of respondents (36.8%) stated that stability of drug products were affected during storage condition. Moreover, study revealed that years of dispensing experience (p=0.007) and educational qualification (p=0.001) of dispensers were significantly associated with practice of maintaining drug stability through proper storage condition. Conclusions: Study revealed that majority of dispensers has a good knowledge and attitude towards drug stability at drug retail outlet of Jimma town. Moreover, years of dispensing experience and educational qualification of dispensers were significantly associated with practice of maintaining drug stability through proper storage condition. Compliance of drug retail outlet to regulatory standard assessment is paramount important.

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Please cite this article in press as **Gemmechu H et al.** Knowledge, Attitude and Practice Assessment of Drug Dispensers Towards Drug Product Stability at Drug Outlet In Jimma Town: A Crossectional Study. *Indo American Journal of Pharmaceutical Research*.2020;10(05).

INTRODUCTION

Drug product stability is the ability of the pharmaceutical dosage form to maintain the physical, chemical, therapeutic and microbial properties during the time of storage and usage by the patients [1]. However, change of physical characteristics which encompasses dissolution rate, content uniformity, appearance, taste and odor of the drug product, with or without significant chemical degradation, may influence the effectiveness and safety of medicine as well as the patient's perceptions [2]. On other hand, due to repeated opening and closing of container closure of drugs, there is a risk to its content with regard to microbiological contamination, physical change, or chemical degradation [3]. Thus, pharmacists who are well trained in the natural, physical, and medical sciences, involved in drug stability issue throughout drug product shelf life, and aware that a single mistake in the daily practice of their profession may potentially result in patient harm and even death [4]. Moreover, aspects of drug product stability are of primary concern to dispensers in the dispensing of drugs at drug retail outlet [5]. However, dispensers of drugs in developing countries often lack qualified and trained personnel to store, label and handle medicines in appropriate way; mainly due to an acute shortage of qualified pharmacists practicing at community pharmacy setting and lack of standard practice guidelines [6]. It has been reported that in most of the cases dispensers lack formal education and training and those who are trained are mostly not available at these pharmacies [7]. Similarly, a comparative cross sectional study conducted at a randomly selected sample of 371 pharmacies in the three cities of Pakistan showed that 66% did not knew which medicines to be kept in the refrigerator and knowledge of refrigerator and vaccine storage temperature [8]. Moreover, study conducted on quality of pharmacy practices in Wa Municipality, Upper West Region, Ghana showed that 19% of the dispensers did not have any formal education, and 48% of the dispensers had no qualification related to pharmacy [9]. To the best of author knowledge's there is no assessment of knowledge, attitude and practice of drug dispensers towards drug product stability at drug retail outlet in Jimma Town (JT). Therefore, this study assessed knowledge, attitude and practice of drug dispensers towards drug product stability at drug retail outlet in JT. Thus, this study may contribute to provide baseline information for dispensers on the issue of drug stability, and may aid to develop strategies for improvement of knowledge, attitude and practice towards drug stability problems, which have direct benefit associated patients.

MATERIALS AND METHODS

Cross-sectional study involving dispenser's interview from Jimma private drug outlet from January to June 2019 at JT was conducted. Jimma town is located 346 km south west direction of the capital city Addis Ababa, Ethiopia. Jimma University Institutional Review Board approved the research. We received a letter of permission from Jimma Regional Health bureau. To collect data we obtained written informed consent of the study participants prior to interviews. The right of participants to withdraw from an interview at any time was maintained. We determined sample size using single population proportion formula [13]. We studied all dispensers from private drug outlet who fulfilled the inclusion criteria, and found in the place during the study period. We translated an English version of the questionnaire to local languages, Afaan Oromo and Amharic, and back translated to English. The data collection tool was also pretested. We included all dispensers from private drug outlet who have at least 2 month experience have given full consent, and available during the study period. Data were collected by two trained 5th year pharmacy students. A structured interviewer administered questionnaire was used to collect data on knowledge, attitude, practice towards drug stability, and sociodemographic characteristics of dispensers.

Statistical analysis

Each questionnaire was checked for completeness and accuracy before entering the data into SPSS. The data was cleaned for errors and missing data, coded, categorized and sorted to facilitate the analysis and entered into the computer. We analyzed the data using SPSS Version 21.0 (Chicago, SPSS Inc.). The results were summarized using in text, percentages, and tables. Moreover, the Chi square test was to determine association between practice of maintaining drug stability through proper storage condition among respondents and sociodemographic characteristics of dispensers.

Results

Socio-demographic Characteristics

A total of 19 dispensers were included in this study, 13(68.4%) of the dispensers were males, and mean age of respondents was 47±13 years. Thirteen (68.4%) were pharmacists and 5(26.3%) were pharmacy technicians (druggists). Majority 17(89.5%) of the studied drug dispensers were employee while others 2(10.5%) are pharmacy owners, and 13(68.4) of the participants were working for 48-72 hour per week [Table 1].

Table 1: socio-demographic characteristics of respondents.

Variables		Frequency(n)	Percentages (%)
Gender	Male	13	68.4
	Female	6	31.6
Age	25-35 years	14	73.7
	>36 years	5	26.3
Educational qualification	Pharmacy technician/druggist	5	26.3
	B.Pharm	13	68.4
Dispensing personnel	Masters in pharmacy	1	5.3
	Pharmacy owner	2	10.5
Year of dispensing experience	Employee	17	89.5
	less than or equal to 2 years	2	10.5
Working hour in drug outlet	3-6 years	8	42.1
	above 6 years	9	47.4
	less than 48 hours	3	15.8
	48-72 hours	13	68.4
Living place location	above 72 hours	3	15.8
	Jimma town	17	89.5
	Others	2	10.5

Knowledge of respondents towards drug stability

Pharmacists' knowledge about drug stability was evaluated by using five questions. Seven (36.8%) respondents have defined medication stability as moderately sufficient during their sales at retail outlets, and also these respondents consider storage condition as factors that affect the overall stability of drug product at their shops. On the other hand considerable number 17(89.5%) of respondents has sufficient knowledge of improper storage condition at retail outlet that affects stability. Twelve (63.2%) of drug dispensers consider stability of drugs product as critical element in pharmaceutical regulatory system. Majority of respondents (36.8) stated that stability of drug products were affected during storage condition [Table 2].

Table 2: Knowledge of dispensers towards drug product stability.

Questions	Responses	Prevalence(n)	Percentages (%)
How do you define medication stability	Quite sufficient	4	21.1
	Sufficient	5	26.3
	Moderately sufficient	7	36.8
	Poor	3	15.8
Overall stability of drug product may be affected during	Drug molecule development	2	10.5
	Patients use	4	21.1
	Manufacturing process	6	31.6
	Storage condition	7	36.8
Improper storage condition at retail outlet can affect stability of medication	Yes	17	89.5
	No	1	5.3
	I don't know	1	5.3
Improper storage condition may impact the efficacy and safety of pharmaceuticals product and ultimately with the patient life	Yes	16	84.2
	No	2	10.5
	I don't know	1	5.3
Stability of drugs product is critical element in pharmaceutical regulatory system	Yes	12	63.2
	No	3	15.8
	I don't know	4	21.1

Attitude of dispensers towards drug product stability

Ten (52.6%) of the dispensers believe or agree that pharmacy professionals are responsible for maintaining drug stability at retail outlet. Eight (42.1%) of dispensers responded that good quality drugs cannot be affected by patterns storage condition at retail outlet. Twelve (63.2%) of the respondents believe that maintaining drug stability at retail outlets are necessary and also 6 (31.1%) of the study participants believe that current pharmacy practice towards drug stability in Jimma is not appropriate. About 6(31.6%) of dispensers agree that different drugs can have different storage condition [Table 3].

Table 3: Attitude of dispensers towards drug product stability.

Questions		Response				
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Pharmacists are responsible for maintaining drug stability at retail outlet	Prevalence	5	10	3	1	0
	Percentages	26.3	52.6	15.8	5.3	0
Good quality drugs cannot be affected by patterns storage condition at retail outlet	Prevalence	2	6	1	8	2
	Percentages	10.5	31.6	5.3	42.1	20.5
Counseling patient about storage condition during dispensing is not necessary	Prevalence	1	1	4	12	1
	Percentages	5.3	5.3	21.1	63.2	5.3
Maintaining drug stability at retail outlets are not necessary	Prevalence	1	1	0	12	5
	Percentages	5.3	5.3	0	63.2	26.3
Current pharmacy practice towards drug stability in Jimma is not appropriate	Prevalence	0	3	7	6	3
	Percentages	0	15.8	36.8	31.6	15.8
Different drugs can have different storage condition	Prevalence	5	6	1	3	4
	Percentages	26.3	31.6	5.3	15.8	21.1

Practice of respondents towards drug product stability

Concerning the dispensing practice, it was found that 15(78.9%) of them have experience of maintaining drug product stability through proper storage condition of drugs. Also, it was noticed from the answers that 21 % of the dispensers maintain drug product stability by informing and educating patients concerning the proper storage & the use of products including disposition of outdated or excessively aged prescriptions. Ten (52.6%) of study participants present drug storage condition instruction to the patients both orally and in written form. Majority of the respondents (78%) report dangerous drug deterioration they face at retail outlets to regulatory affairs [Table 4].

Table 1: Practice of pharmacist towards drug product stability.

Variables		Prevalence	Percentages
Do you have experience of maintaining drug product stability through proper storage condition of drugs	Yes	15	78.9
	No	4	21.1
If you have no experience of maintaining drug product stability through proper storage condition of drugs, why?	Beyond my capacity	1	5.3
	I have no training on stability	2	10.5
	Negligence	1	5.3
If you have experience of maintaining of drug stability through proper storage condition of drugs, how do you maintain?	Dispensing oldest stock 1 st and observing expiration date	5	26.3
	Storing products under environmental conditions stated in individual monographs	3	15.8
	Observing products for evidence of instability	2	10.5
	Properly treating and labeling products that are repackaged, diluted, or mixed with other products	1	5.3
	Informing and educating patients concerning the proper storage & the use of products including disposition of outdated or excessively aged prescriptions	4	21.1
How do you present drug storage condition instruction to the patients	Orally during dispensing	9	47.4
	Both orally and in written form	10	52.6
What is your reaction if you face dangerous drug deteriorations at retail outlets	Reporting to regulatory affairs	15	78.9
	Go ahead as it is	3	15.8
	I have no idea	1	5.3

Association between practice of maintaining drug stability through proper storage condition among respondents and sociodemographic characteristics of dispensers

Current study revealed that years of dispensing experience ($p=0.007$) and educational qualification ($p=0.001$) of dispensers were significantly associated with practice of maintaining drug stability through proper storage condition [Table 5]

Table 5: Cross tabulation of sociodemographic characteristics of dispensers and practice of proper storage condition.

Variables			Practice of maintaining drug stability		Chi-square	p-value
			Yes	No		
			Frequency (n)			
Gender	Male	13	11	2	0.796	0.373
	Female	6	4	2		
Age	25-35 years	14	11	3	0.005	0.728
	>36 years	5	4	1		
Educational qualification	Pharmacy technician	5	1	4	14.187	0.001*
	B.Pharm	13	13	0		
	Masters in pharmacy	1	1	0		
Dispensing personnel	Pharmacy owner	2	2	0	0.596	0.614
	Employee	17	13	4		
Year of dispensing experience	less than or equal to 2 years	2	0	2	9.975	0.007*
	3-6 years	8	6	2		
	above 6 years	9	9	0		
Working hour in drug outlet	less than 48 hours	3	3	0	1.104	0.576
	48-72 hours	13	10	3		
	above 72 hours	3	2	1		
Living place location	Jimma town	17	13	4	0.596	0.614
	Others	2	2	0		

DISCUSSIONS

Explorations of the stability of drugs product is critical element in pharmaceutical regulatory system. To proceed this pharmacists are placed at the first point of contact in the health care system due to their easy accessibility [3]. A total of 19 dispensers were included in this study, 13(68.4%) of the dispensers were males, and mean age of respondents was 47 ± 13 years. The higher percentages of males dispenser may due to greater number of male dispensers in Ethiopia [10] and mean age of study participants was higher. This discrepancy may be due to long years for education for Pharmacy and provision of licence (five years) by authority in Ethiopia [11]. Pharmacists' knowledge about drug stability was evaluated by using five questions. Seven (36.8%) respondents have defined medication stability as moderately sufficient, and also these respondents (36.8%) stated over stability of drug products were affected during storage condition. This fragmentary knowledge may affect the quality of drug products. The current study slightly dissimilar with study conducted in Pakistan in which the overall knowledge and training of dispensers working at community pharmacies in Pakistan is inadequate [8]. Since, defining drug stability and stating storage condition as a major factor is critically related with knowledge of dispensers about drug stability during storage condition, and ensuring the integrity of pharmaceutical products is important through proper storage. On the other hand considerable number 17(89.5%) of respondents has sufficient knowledge of storage condition at retail outlet as it affects drug stability. Twelve (63.2%) of drug dispensers consider stability of drugs product as critical element in pharmaceutical regulatory system. This magnitude critically indicates that respondents have understanding of drug stability as one of basic regulatory requirements of drug retail outs. For instance, the regulatory compliance of majority of the drug stores operated privately in different areas of Karachi is below standard [12]. Even though, current study was not conducted on regulatory compliances of drug store, it gives promising clue as more than half of study participants understand drug stability is paramount important pharmaceutical regulatory system. Regarding attitude of dispensers towards drug stability, majority of study participants have positive attitude towards drug stability. Accordingly, 10(52.6%) of the dispensers believe or agree that pharmacy professionals are responsible for maintaining drug stability at retail outlet. Eight (42.1%) of dispensers responded that good quality drugs cannot be affected by patterns storage condition at retail outlet. Twelve (63.2%) of the respondents believe that maintaining drug stability at retail outlets are necessary and also 6 (31.1%) of the study participants believe that current pharmacy practice towards drug stability in Jimma is not appropriate. About 6 (31.6%) of dispensers agree that different drugs can have different storage condition. Moreover, current study revealed that years of dispensing experience ($p=0.007$) and educational qualification ($p=0.001$) of dispensers were significantly associated with practice of maintaining drug stability through proper storage condition. Recent study reported that experience and levels of education were significant ($p<0.05$) associated with in the knowledge of dispensers working at community pharmacies [8]. Thus, this report have the slightly similar description as a good knowledge might related to practice of maintaining drug stability through proper storage condition.

CONCLUSIONS

Majority of dispensers in Jimma Town have a good knowledge and attitude towards drug stability at drug retail outlet. Besides, most of dispensers also consider drug stability as critical element in pharmaceutical regulatory system. Moreover, years of dispensing experience and educational qualification of dispensers were significantly associated with practice of maintaining drug stability through proper storage condition. Compliance of drug retail outlet to regulatory standard assessment is paramount important.

ABBREVIATIONS

SPSS : - Statistical Package for Social Sciences
JT : - Jimma Town

ACKNOWLEDGEMENTS

Study was support by Jimma University thus we are very grateful for Jimma University. The authors also would like to acknowledge all study participants and individual who provided information.

Authors' Contributions

MA and GH designed, extracted, analyzed and interpreted the data. GH, MA, HH, FA, SB prepared the manuscript. All authors read and approved the final manuscript.

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