Assessment of awareness and attitude towards counterfeit medicines among pharmacy professionals working in community drug retail outlets in Harar town, Ethiopia

Eklas Abdunasir¹*, Teshome Sosengo¹, Frehiwot Amare¹, Mohammed Yimam² and Bisrat Hagos¹

¹School of Pharmacy, College of Health and Medical Sciences, Haramaya University, Ethiopia
²Department of Pharmacy, College of Health and Medical Sciences, Mizan-Tepi University, Ethiopia

*Corresponding Author: Eklas Abdunasir, School of Pharmacy, College of Health and Medical Sciences, Haramaya University, Ethiopia, Email: abasuleyman9@gmail.com

Received Date: Dec 21, 2020 / Accepted Date: Dec 30, 2020 / Published Date: Jan 04, 2021

Abstract

Background: Counterfeit medicines are drugs which are deliberately and fraudulently mislabeled with respect to identity and/or source. According to the WHO 2017 report, about 1% of prescribed medicines in the developed world and about 10-50% in parts of the developing world are estimated to be counterfeits.

Objective: The objective of this study was to assess the knowledge and attitude of pharmacy professionals towards counterfeit medicines in Harar town.

Method: A cross sectional study was conducted among pharmacy professionals found in Harar town, East Ethiopia. All pharmacy professionals working in community drug retail outlets of Harar town was included in the study. Accordingly, 92 pharmacy professionals were included in the study. The data was collected by using self-administered questionnaire. The questionnaire was prepared in English language. Data was coded, entered and analyzed by using Statistical Package for Social Science version 22. Then chi-square(x²) test was performed to determine there exists association of socio-demographic characters, profession and year of service towards awareness and attitude about counterfeit medicines was investigated using.

Result: A total of 92 respondents were included in the study. The majority, 76 (82.6%), of the study participants had information about counterfeit medicine. The 26(28.3%), 42(45.7%) and 24(26%) of the respondents replied that counterfeit medicines have problem of efficacy, safety and cause economic problem on sellers of genuine drugs respectively. Majority of the study of the study participants were not aware of a way of identification of counterfeit medicines, with only 18(19.6%), 47(51.1%) and 27(29.3%), replied that counterfeit medicines can be identified by its effect, inspection and cost respectively. Majority of the respondents, 60(65.2%), responded that pharmacy professionals that knowingly dispense counterfeit medicine are business man /women. Most of the respondents, 66(71.7%), replied that pharmacy professionals carry out the business of counterfeit medicines transaction because of big profit obtained from such an activity. gender, profession and year of service towards awareness and attitude about counterfeit medicines was investigated.

Conclusion: Significant proportion of the study participants were not aware of the problems associated with counterfeit medicines as efficacy, safety and economic problems. Majority of the respond-ents still are unaware about ways of identification of counterfeit medicines as inspection, by efficacy and cost.

Keywords: Counterfeit medicines; Awareness; Attitude; Professionals; Drug retail outlets
Assessment of awareness and attitude towards counterfeit medicines among pharmacy professionals working in community drug retail outlets in Harar town, Ethiopia

Cite this article as: Eklas Abdunasir, Teshome Sosengo, Frehiwot Amare, et al. 2021. Assessment of awareness and attitude towards counterfeit medicines among pharmacy professionals working in community drug retail outlets in Harar town, Ethiopia. Open J Pharm Sci Res. 3: 01-11.

Copyright: This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. Copyright © 2021; Eklas Abdunasir

Introduction

Poor quality drugs are worldwide problem with high prevalence in low- and middle-income countries [1,2]. Poor quality medicines include substandard and counterfeited medicines. WHO report of 2017 estimates that the rates of substandard and falsified (i.e. counterfeit) medical products in low- and middle-income countries is approximately 10.5% with an estimated spend of US$ 30.5 billion [2]. Substandard medical products are authorized medical products that fail to meet either their quality standards or their specifications or both [2]. Counterfeit medicines (CFM) are medicines which are deliberately and fraudulently mislabelled with respect to identity and/or source and may include products with correct or wrong ingredients, without active ingredients, with insufficient or inadequate quantities of ingredient(s) or with fake packaging [3-5]. According to the WHO 2017 report, about 1% of prescribed medicines in the developed world and about 10–50% in parts of the developing world are estimated to be counterfeits [1]. Poor quality pharmaceuticals invade health care system because of a number of problems starting from manufacture to final use by patients. Non adherence to good practices in manufacturing, storage, distribution and dispensing, weak enforcement of pharmaceuticals regulatory laws, open borders, poor coordination of police and customs, corruption, double standards during production of pharmaceuticals i.e. better standards for manufacture of drugs to be exported rich countries and the poor standard for to be exported to poor countries as Sub-Saharan African countries and low educational level results in invasion of the health care system with poor quality pharmaceuticals [6-8]. The problem of poor-quality medicines affects almost all categories of drugs. Antibiotics and anti-malarials are most commonly reported poor quality drugs [2,9,10]. Treatment with poor quality medicines, counterfeited medicines, causes deleterious problems as treatment failure, increased morbidity and mortality, wastage of budget of family and government and emergence of drug resistance [11-13]. A standard dose kills drug susceptible strains of microbes and suppresses multiplication of the drug resistant microbes. Substandard medicines selectively kill the susceptible strain and leaves resistant strain to multiply [1,14]. Microorganisms that have developed resistance transmits resistance gene through exchange of genetic material. An estimated 700,000 Africans die annually from consuming fake anti-malarial or tuberculosis drugs [13]. In Panama, cough syrup with deliberately mislabelled ingredient-Diethylene glycol instead of glycerin killed about 200 people [15]. In Sub-Saharan Africa an estimated 400,000 children are exposed to malaria are treated with poor quality anti-malaria medicines [15]. In Ethiopia, there exists poor co-ordination of police and custom, a factor that results in invasion of the health care system by counterfeited pharmaceuticals and hence in exposure of the patients, community and the government to the deleterious impacts of such poor-quality pharmaceuticals [16]. Counterfeited medicines can easily circulate in Harar town because of the close proximity of the town to the border, shortage of medicine in the town and weak enforcement of law and legislation prohibiting the circulation and use of
counterfeited medicines (CFM) [16]. Pharmacy professionals play a key role in protecting patients from CFM. This can be ensured when the pharmacy professionals have adequate awareness and attitude on CFM. The awareness and attitude of pharmacy professionals plays a critical role in reducing the circulation and use of CFM in the town and reducing the burden posed by CFM on the health care system of the town and the country at large. Therefore, this study assessed the awareness and attitude of pharmacy professionals towards CFM in Harar town.

**Methodology**

**Study area and period:** The study was carried out among pharmacy professionals working in community drug retail outlets located in Harar town, Harari regional state, Ethiopia. The study was conducted from March 10-April 10, 2019.

**Study design:** A cross sectional study was conducted among pharmacy professionals found in Harar town.

**Population**

**Source of population:** All pharmacy professionals of Harar town.

**Study population:** All pharmacy professionals who work experience are greater than 3 months.

**Sample size:** All pharmacy professionals working in community drug retail outlets of Harar town was included in the study. Accordingly, 92 pharmacy professionals were included in the study.

**Data collection method:** The data was collected by using self-administered questionnaire. The questionnaire was prepared in English language.

**Data quality control:** Before starting data collection, pre-test was done on 5% of community pharmacy professional to ensure the completeness, validity and reliability of the questionnaire with the objective of the study and after that necessary correction was done on the questionnaire.

**Data analysis**

Data was coded, entered and analyzed by using SPSS (Statistical Package for Social Science) version 22. Then chi-square($x^2$) test was performed to determine there exists association of socio-demographic characters, profession and year of service towards awareness and attitude about counterfeit medicines was investigated using.

**Ethical consideration**

The study was conducted after ethical clearance was obtained from school of Pharmacy. Informed consent was obtained from each participant after explaining the objective of the study.

**Operational Definitions**

**Attitude:** degree of agreement or disagreement with respect to safety, efficacy quality and cost of counterfeit drugs with regard to genuine drugs.

**Knowledge:** respondents’ level of awareness towards CFM, with respect it is information and circulation of CFM deliberately/fraudulently misrepresent their identity, composition or source.

**Druggists:** Pharmacy professionals whose educational level is diploma.

**Pharmacists:** Pharmacy professionals whose educational level is degree.

**Pharmacy professionals:** Individuals having degree and diploma in in pharmacy department and involved in giving pharmaceutical care.

**Poor quality drugs:** Drugs that include substandard and counterfeit medicines.

**Quality:** The degree to which a set of inherent properties of a product, system or process fulfills requirements.
Assessment of awareness and attitude towards counterfeit medicines among pharmacy professionals working in community drug retail outlets in Harar town, Ethiopia

DOI: https://doi.org/10.36811/ojpsr.2020.110010

OJPSR: January-2021: Page No: 01-11

Results

Socio demographic characteristics

Nighty two, 92, study participants was included in the study. The, 60(65.2%) and 32(34.8%) of the respondents were males and females respectively. The 5(47.4%) and thirty-eight, 38(41.3%) of the respondents were married and single. The majority of the respondents, 69(75%), were druggists, while 23(25%) were pharmacists (Table 1).

| Variable | Category | Frequency | % |
|----------|----------|-----------|---|
| Gender   | Male     | 60        | 65.2 |
|          | Female   | 32        | 34.8 |
| Marital status | Single | 38        | 41.3 |
|          | Married  | 45        | 48.9 |
|          | Widowed  | 9         | 9.8  |
| Ethnicity | Oromo   | 35        | 38   |
|          | Amhara   | 35        | 38   |
|          | Harari   | 22        | 24   |
| Profession | Druggist | 69        | 75   |
|          | Pharmacist | 23        | 25   |
| Year of service | <5 years | 67        | 72.8 |
|          | >5 years | 25        | 27.2 |

% Percentage

Awareness towards CFM

The majority, 76 (82.6%), of the study participants had information about CFM. Most of the respondents, 75(81.3%) had information on circulation of CFM in the pharmaceutical market. Half, 46(50%), of the study respondents described CFM as medicines with correct packaging with incorrect identity or quantity of active ingredient but only 25(27.2%), 11(12%) and 10(10.1%) of the respondents described CFM as medicines with fake packaging but with correct identity and quantity of active ingredient, products which with toxic impurities and fake packaging with fake active ingredient respectively. More than half of the respondents were not aware of problems associated with CFM. Only 26(28.3%), 42(45.7%) and 24(26%) of the respondents replied that CFM have problem of efficacy, safety and cause economic problem on sellers of genuine drugs respectively. Majority of the study of the study participants were not aware of a way of identification of counterfeit medicines, with only 18(19.6%), 47(51.1%) and 27(29.3%), replied that CFM can be identified by its effect, inspection and cost respectively (Table 2).
Table 2: Study participants’ awareness towards CFM Harar town, 2019.

| Variable                                      | Awareness towards CFM | Frequency | %   |
|------------------------------------------------|------------------------|-----------|-----|
| Information about CFM                        | Yes                    | 76        | 82.6|
|                                                | No                     | 16        | 17.4|
| Description about CFM                        | Correct packaging but incorrect identity or quantity of active ingredient | 46        | 50  |
|                                                | Fake packaging but correct identity and quantity of active ingredient | 25        | 27.2|
|                                                | Product with toxic impurities | 11        | 12  |
|                                                | Fake packaging and active ingredient | 10        | 10.1|
| Information on circulation of CFM in the market | Yes                    | 75        | 81.5|
|                                                | No                     | 17        | 18.5|
| Drug at high risk for counterfeiting          | Antibiotic             | 42        | 45.7|
|                                                | Analgesics             | 32        | 34.8|
|                                                | Vitamins               | 10        | 10.9|
|                                                | Steroids               | 1         | 1.1 |
|                                                | Hormones               |           |     |
| Percentage of drugs that are counterfeit      | <30%                   | 50        | 54.3|
|                                                | 30%-40%                | 21        | 22.8|
|                                                | 40%-50%                | 17        | 18.5|
|                                                | >50%                   | 4         | 4.3 |
| Problem that occurs if counterfeit drug is consumed | Efficacy problem  | 26        | 28.3|
|                                                | Safety problem         | 42        | 45.1|
|                                                | Economic problem       | 24        | 26  |
| Way to identify counterfeit drugs             | By its effect          | 18        | 19.6|

www.raftpubs.com
Assessment of awareness and attitude towards counterfeit medicines among pharmacy professionals working in community drug retail outlets in Harar town, Ethiopia

Most of the study respondents, 84(91.3%) replied (i.e., strongly agreed or agreed) that prescribing and dispensing CFM is unethical. With regard to efficacy of counterfeit drugs, 53(57.6%), of the respondents responded (i.e., strongly disagreed or disagreed) with the statement that there is no difference in efficacy between CFM and their genuine counterpart drugs. From the study participants, 51(55.4%), replied (i.e., strongly agreed or agreed) that CFM are cost effective drugs as compared to genuine counterparts. Fifty-two, 52(56.6%), of the respondents responded (i.e., strongly disagreed or disagreed) with the statement that CFM are as safe as genuine counterparts. Majority of the respondents, 60(65.2%), responded (i.e., strongly agreed or agreed) that pharmacy professional that knowingly dispense counterfeit medicine are business man/women. Most of the respondents, 66(71.7%), replied (i.e., strongly agreed or agreed) that pharmacy professionals carry out the business of CFM transaction because of big profit obtained from such an activity. With regard to the law to control CFM, 71(77.2%), responded (i.e., strongly agreed or agreed) that the law against CFM should be strengthened (Table 3).

| Table 3: Respondents attitude towards CFM Harar town, 2019. |
|-----------------------------------------------------------|
| Variable                                                   | Attitude towards CFM | Frequency | %   |
| Dispensing and prescribing CFM is unethical                 | Strongly agree        | 67 62.2   | 72.8|
|                                                           | Agree                 | 17 18.8   |     |
|                                                           | Neutral               | 3 3.26    |     |
|                                                           | Disagree              | 3 3.26    | 3.26|
|                                                           | Strongly disagree     | 2 2.22    |     |
| Dispensing and prescribing CFM is illegal                  | Strongly agree        | 60 62.2   | 62.2|
|                                                           | Agree                 | 26 28.3   |     |
|                                                           | Neutral               | 2 2.2     |     |
|                                                           | Disagree              | 2 2.2     |     |
|                                                           | Strongly disagree     | 2 2.2     |     |
| There is no difference in efficacy between counterfeit and genuine counterparts | Strongly agree | 2 2.2 | |
|                                                           | Agree                 | 15 16.3   |     |
|                                                           | Neutral               | 22 23.9   |     |
|                                                           | Disagree              | 17 18.5   |     |
|                                                           | Strongly disagree     | 36 39.1   |     |
| Using CFM is cost effective                                | Strongly agree        | 24 26.1   |     |
|                                                           | Agree                 | 27 29.8   |     |
|                                                           | Neutral               | 10 10.9   |     |
|                                                           | Disagree              | 22 23.9   |     |
Assessment of awareness and attitude towards counterfeit medicines among pharmacy professionals working in community drug retail outlets in Harar town, Ethiopia

DOI: https://doi.org/10.36811/ojpsr.2020.110010

Factors significantly associated with awareness towards CFM

The association of socio-demographic character, profession (i.e., druggist or pharmacist), year of service in serving as pharmacy professional on awareness and attitude status towards counterfeit medicines was investigated using chi-square($x^2$) test. Accordingly, gender, profession, year of service in serving as pharmacy professional was found to be significantly associated with awareness towards CFM, (p<0.05) (Table 4).

| Variable | Awareness towards CFM | Category Freq.* | chi-square test($x^2$) |
|----------|------------------------|-----------------|-----------------------|
| Gender   | Information about CFM  |                 |                       |
|          | Yes                    | 76              |                       |
|          | No                     | 16              |                       |

Table 4: Association of selected characteristics of the respondent’s awareness towards counterfeit medicines, Harar town, 2019.
### Discussion

The majority of the study participants, 76(82.6%) had information about CFM. The finding of the current study is slightly better than study result of the done in Jordan, in which 76(76%) of the study respondents had information about CFM [17]. The proportion of study respondents who had information about CFM is lower than study the other study report of a study done in Lebanon in which, 422(93%), had heard (i.e., had information) of CFM [18]. The difference may be due to differences in educational status of the study participants on the studies. In the study done in Lebanon, 164(36.8%) and 62(13.9%) had bachelor and postgraduate (graduate) degrees respectively, while in the current study only 23(25%) of the study participants are pharmacists (i.e. have bachelor degrees). In this study, the socio-demographic characteristic, gender, was found to be significantly associated with information about circulation of CFM in the pharmaceutical market (p<0.05). With respect to the problems caused by CFM, only 26(28.3%), 42(45.7%) and 24(26%) of the respondents replied that CFM have problem of efficacy, safety and cause economic problem on sellers of genuine drugs respectively. The participants status of awareness about a problem caused by CFM is similar to study result of a study done in Iran [19]. The magnitude of respondents who were aware about problems caused by CFM is significantly lower than study report of a study done Egypt among 175 respondents, in which 66.8% of the study respondents perceived as CFM as inactive, 61.7% as harmful and 28.6% as less effective/less expensive [20]. Pharmacy professional’s unawareness about dangerous effects of CFM causes negligence on the professionals about CFM and hence results in a wide spread circulation of CFM in the health sector.

| Profession* | CFM have efficiency problem | Yes 66 | \( \chi^2(1,92) = 52.112, \) p=0.00 |
|-------------|-----------------------------|--------|----------------------------------|
|             | CFM have safety problem     | Yes 42 | \( \chi^2(1,92) = 30.900, \) p=0.00 |
| Profession* | CFM are identified by their effect | Yes 18 | \( \chi^2(1,92) = 11.143, \) p=0.002 |
|             | CFM are identified by inspection | Yes 45 | \( \chi^2(1,92) = 15.790, \) p=0.000 |
|             | CFM are identified by their cost | Yes 27 | \( \chi^2(1,92) = 56.779, \) p=0.000 |
| Profession*: druggist And Pharmacist | Freq*: Frequency | | |

www.raftpubs.com
Assessment of awareness and attitude towards counterfeit medicines among pharmacy professionals working in community drug retail outlets in Harar town, Ethiopia

DOI: https://doi.org/10.36811/ojpsr.2020.110010

Significant proportion of the study participants were not aware of the problems associated with counterfeit medicines as efficacy, safety and economic problems. Majority of the respondents still are unaware about ways of identification of counterfeit medicines as inspection, by efficacy and cost.

Recommendation

Responsible bodies should provide educational training to the study respondents to increase awareness and attitude about CFM.
Acknowledgement

The author acknowledges Haramaya University School of pharmacy and the respondents for all positive co-operations during the conduction of the study.

Declarations

Author’s contribution: Author EA involved in the conception and design of the study, participated in the literature searches, supervised data collection and analyzed data. Author FA and MY participated in the design of the study, supervised data collection and the overall research, and commented the manuscript. Author TS and BH involved in the conception and design of the study, participated in the literature searches, analyzed data and wrote the manuscript. All the authors approved the final manuscript.

Availability of data and materials: The supporting documents for this study can be available from the corresponding author upon request.

References

1. WHO. 2017. WHO global surveillance and monitoring system for substandard and falsified medical products, Geneva, Switzerland.
2. Almuzaini T, Choonara I, Sammons H. 2013. Substandard and counterfeit medicines: a systematic review of the literature. BMJ. 3: 002923. Ref.: https://pubmed.ncbi.nlm.nih.gov/23955188/
3. WHO. 1999. Counterfeit and substandard drugs in Myanmar and Viet Nam, Geneva, Switzerland.
4. WHO. 2010. Assessment of medicines regulatory systems in Sub-Saharan African countries. Geneva, Switzerland.
5. Ravinetto R, Vandenberghe D, Macé C, et al. 2016. Fighting poor-quality medicines in low- and middle-income countries: the importance of advocacy and pedagogy. Journal of pharmaceutical policy and practice. 9: 36. Ref.: https://pubmed.ncbi.nlm.nih.gov/27843547/
6. Caudron JM, Ford N, Henkens M, et al. 2008. Substandard medicines in resource-poor settings: a problem that can no longer be ignored. Tropical medicine and international health. 13: 1062-1072. Ref.: https://pubmed.ncbi.nlm.nih.gov/18631318/
7. SPS. 2011. Safety of medicines in Sub-Saharan Africa assessment of pharmacovigilance systems and their performance, Arlington, USA.
8. Kaur H, Allan EL, Mamadu I, et al. 2015. Quality of artemisinin-based combination formulations for malaria treatment: prevalence and risk factors for poor quality medicines in public facilities and private sector drug outlets in Enugu, Nigeria. PLoS ONE. 10: 0125577.
9. Kelesidis T, Falagas E. 2015. Substandard/counterfeit antimicrobial drugs. Clinical microbiology reviews. 28: 443-464. Ref.: https://pubmed.ncbi.nlm.nih.gov/25788516/
10. Sammons HM, Choonara I. 2017. Substandard medicines: a greater problem than counterfeit medicines? BMJ Paediatrics Open. 1: 000007. Ref.: https://pubmed.ncbi.nlm.nih.gov/29637090/
11. Newton PN, Green MD, Fernández FN. 2009. Impact of poor-quality medicines in the developing world. Trends in pharmacological sciences. 31: 99-101. Ref.: https://pubmed.ncbi.nlm.nih.gov/20117849/
12. Alhedethe A, Alhudaithy K, Zloh M. 2017. An evaluation of prevalence of low quality of medicines in Saudi Arabia and factors associated an analytical comparative study. Archives in chemical research. 1: 1-18.
13. Wilson JM. 2011. The health and economic effects of counterfeit pharmaceuticals in Africa.
14. Newton PN, Caillet C, Guerin PJ. 2016. A link between poor quality antimalarials and malaria drug resistance?.. Expert review of anti-infective therapy. 14: 531-533. Ref.: https://pubmed.ncbi.nlm.nih.gov/27187060/
15. Seither A. 2009. Health and economic consequences of poor-quality medicines.
Clinical pharmacology and therapeutics. 4: 476-478.

16. Suleman S, Woliyi A, Woldemichae K, et al. 2016. Pharmaceutical regulatory framework in Ethiopia: A critical evaluation of its legal basis and implementation. Ethiop J Health Sci. 26: 259-276. Ref.: https://pubmed.ncbi.nlm.nih.gov/27358547/

17. Taleb YA, Madadha RA. 2013. Pharmacist’s awareness of drug counterfeiting in Jordan. JRMS. 20: 57-70.

18. Sholy L, Saliba C. 2018. Public awareness, experiences and views about counterfeit medicines in Lebanon. Journal of Pharmaceutical Health Services Research. 9: 161-169.

19. Shahverdi S, Hajimiri M, Pourmalek F, et al. 2012. Iranian pharmacists’ knowledge, attitude and practice regarding counterfeit drugs. Iranian Journal of Pharmaceutical Research. 11: 963-968. Ref.: https://pubmed.ncbi.nlm.nih.gov/24250525/

20. Bashir A, Galal S, Ramadan A, et al. 2019. Community pharmacists’ perceptions, awareness and practices regarding counterfeit medicines: a cross-sectional survey in Alexandria, Egypt. East Mediterranean Health Journal. 26: 556-564.

21. Lowe RF, Mongatu D. 2009. Legislation, regulation and consolidation in retail pharmacy sector in low-income countries. Med review. 2: 35-44.

22. Christian L, Collins L, Kiatgrajai M, et al. 2012. The problem of substandard medicines in developing countries. 1-81.

23. WHO. 2010. Assessment of medicines regulatory systems in Sub-Saharan African countries. Geneva, Switzerland.