

The Impact of Demographic Characteristics on Vulnerability of Consumers to Counterfeit Drugs in a Developing Country

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Abstract

Background: Counterfeiting of medicines in developing countries has been reported as a distressing issue. Moreover, although desperate need and drug counterfeiting are linked, no much study has been carried out to cover this area.

Objective: The objective of this study is to assess the impact of demographic variables, including age, annual income, working status, education, and gender with respect to increasing or decreasing vulnerability of consumers to counterfeit drugs.

Methods: This article reports on two studies conducted in two Sudanese states, namely Khartoum and Gadaref. In study 1 in-depth qualitative interviews with a purposive sample of knowledgeable policy-makers and community pharmacists were undertaken. Study 2 employed a face-to-face structured interview survey methodology to collect data from 1003 subjects. Descriptive and inferential statistical techniques (ANOVA) were used to evaluate the data.

Results: The paper identified demographic groups who are more vulnerable to counterfeit drugs. Thematic content analysis of the interviews identified difference in vulnerability according to demographic characteristics pertaining to counterfeit drugs. Also a significant difference in purchase intention of counterfeit drugs was supported for all demographic groups (annual income $F(4,998)=6.255, p<0.05$; working status $F(9,993)=2.402, p<0.05$; educational level $F(3,999)=2.975, p<0.05$; gender $F(1,1001)=11.595, p<0.05$) with exception of age groups.

Conclusion: This study concluded that only economic status of consumers has a major role in increasing or decreasing vulnerability to counterfeit drugs. As very limited studies have been conducted, in developing countries in particular, to explore purchase behavior toward counterfeit drugs, this current study is hoped to fill that gap.

Keywords: Counterfeit drugs; Consumers behavior; Developing country

Introduction

Drugs counterfeiting is considered as a serious health and economic problem. It threatens consumer health and safety [1-3], affects consumer confidence in legitimate products, and causes loss of revenues [4]. Also the counterfeit drugs trade has become widespread and has developed into a substantial threat to both public health and pharmaceutical industry [5], especially in developing countries. According to the International Anti-Counterfeiting Coalition (IACC) the rapid increase of counterfeiting makes it, in fact, “a problem that has grown over 10,000 percent in the past two decades, in part fuelled by consumer demand” [6]. According to the World Health Organization, 60% of counterfeit drug cases take place in less-developed countries, where it is estimated that more than 25% of the drug supply is counterfeit [7]. Also, despite the rising combating efforts by large developing countries like China and India, some sources reported that India account for about 52% of fraudulent medications detected by the border customs of the European Union [8].

During the last decades, drugs counterfeiting has increasingly attracted the academic research interest. There has been various published work (theoretical and empirical) on exploring, measuring, or combating drug counterfeiting. However, most of the existing relevant literature on measuring the prevalence of counterfeit drugs has primarily focused upon withdrawing samples from the market and running laboratory testing. While those efforts may, to some extent, succeed in measuring or describing the prevalence of counterfeit drugs in developing countries, these studies fail to consider the factors

contributing to prevalence of these drugs and, consequently, the steps which should be taken to arrive at a policy to root them out. Also, it has been argued that despite counterfeiting has existed long time ago, knowledge about consumer behaviour toward counterfeit products and the influencing factors that motivate willingness to purchase counterfeits is still very limited [9]. This has been appreciated by several researchers, who suggested that further investigation of consumer behaviour and counterfeits is needed [10-12].

Moreover, while drug counterfeiting in developing countries is an increasingly serious problem, surprisingly, insufficient research has been dedicated to understanding the counterfeit drug phenomenon. Currently, most of the research exploring counterfeiting from the consumer perspective has used data collected in the advanced world [3,10,13] or from Asia [11,14,15]. While the results from such research may help to provide an understanding of at least developed countries consumer behaviour related to counterfeit drugs, they cannot be a substitute for research on less-developed countries' consumers for various reasons, e.g. socioeconomic, cultural, and

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environmental. The drug counterfeiting phenomenon has developed differently in different regions [16] and there is no indication whether or not consumers living in areas and/or coming from different backgrounds perceive it similarly [17]. Significantly, there is evidence that remarkable distinctions necessitate a more fine-tuned approach in combating drug counterfeiting in different regions. However, these differences between developed and developing countries are generally not seriously considered in the available literature. This is an important shortcoming, as an understanding of the factors that influence counterfeiting in particular economic region is tremendously valuable. Solutions that specifically act in response to such factors can make far more efficient strategies. Therefore, to design more efficient combating strategies in developing countries, there is a need for marketing managers and public health policymakers to start focusing on the demand side of the counterfeit drugs problem in the context of developing, not developed, countries. Therefore, the examination of the final purchasers' characteristics and their impact on counterfeiting is important. However, the academic research examining consumers' characteristics and counterfeits is relatively limited and many previous research findings suggest that the demographic characteristics do not have a consistent relationship with the purchasing or the intention to purchase counterfeit brands [3,10].

Also, this study motivated by research challenged the view that price could be the main factor driving the buyers intention to purchase counterfeit products and suggested that some non-price factors, such as attitude, brand status, education level, household income, appearance, image, perceived fashion content, purpose and quality, have a significant impact on consumers' intention of purchasing counterfeits [11].

A baseline definition of the term counterfeit drug is needed as an approach to this paper. However, the language used to distinguish between different types of pharmaceutical counterfeiting is inherently confusing. For example, while according to the WHO definition, which is the most widely used, counterfeiting can apply to both branded and generic products, according to the FDA definition, if the drug is generic and labeled as such, then it would fall outside of the scope of the FDA definition of counterfeit. Anyhow, in general, the term "counterfeit drug", as commonly understood, similarly evokes a wide range of (mostly) negative images.

In this study, the authors aim to contribute towards the filling of the identified literature gap by studying the impact of demographic characteristics on vulnerability of consumers to counterfeit drugs in developing countries. To accomplish this purpose, this study limits its scope to an examination of age, gender, educational level, working status and annual income, and their exploratory power in predicting the purchase intention of counterfeit drugs in a developing country.

Methods

In this study, a pragmatic view was adopted by using multiple research methods, that combine qualitative and quantitative data to suit the aims of the study. This is because the literature suggests that factors influence purchase intention of counterfeit drugs tend to be complex and context dependent [18,19]. The evaluation of the influence of these factors must therefore, be sufficiently comprehensive and rich to encompass that complexity and to understand context [20]. The combination of qualitative and quantitative approaches, in which the two approaches inform one another to fulfill the specific aim of the study, has broad appeal in public health research [21]. However, the primary aim of using mixed methods is deepened insight not formal validation.

This study took place in Sudan, from June 2010 to April 2011. In study 1 (qualitative) a semi-structured questionnaire was used. Interviews were conducted with a purposive sample of health Policy-Makers (PM) and Community Pharmacists (CP) who thought to have knowledge and experiences with counterfeit drugs in the investigated setting. Altogether, eleven interviews were conducted. The in-depth interview design of this study provided an opportunity to ask health care providers in Sudan to use their knowledge and expertise to describe how they perceive consumers' demographic characteristics may impact counterfeit drugs purchase intention. This included getting them to rate what they perceive as most influencing demographic character most probably increase consumers' vulnerability to counterfeit drugs, and to include any ideas and suggestions they believe could help in combating counterfeit drugs problem.

The choice of a policy-maker was based upon his role in the policy-making process, or as a head of department with direct links to medicine policy or medicine regulation. Permission was granted from the directors of the Research Departments to conduct this research. Verbal consent of all respondents was given after they were assured about the confidentiality and the purpose of the study was clearly explained to them, as well as being informed about the official permission from the relevant health authority. The questions for these two kinds of interviewees (i.e. policy-makers and community pharmacists) were carefully worded and arranged for the purpose of taking each respondent from the same group through the same sequence and asking each respondent the same questions in order to reduce the variation that can occur from asking different questions to different respondents. In addition, this approach was very helpful with the data analysis because the authors were easily able to locate the respondents' answers to the same questions and compare similar questions and answers quickly [22].

The interviews took an average of thirty minutes for community pharmacists and fifty minutes for policy-makers and were conducted by the first author. Interviews were conducted in Arabic and were audio taped and transcribed verbatim. Analysis followed the principle of the constant comparative method [23] whereby the hard copy of the transcript was read multiple times to facilitate familiarity and to identify themes. Data analysis occurred concurrently with data collection so that the authors could generate an emerging understanding about research questions, which in turn informed both the sampling and the questions being asked. This iterative process of data collection and analysis eventually led to a point in the data collection where no new categories or themes emerged, or in other words, saturation was reached [24].

In study 2 a questionnaire was developed based on pertinent literature reviews and expert interviews. It was pre-tested and checked for content and face validity. The questionnaire used in this research was in Arabic and consisted of a part for collection of demographic information. A convenience sample of Sudanese consumers was used and 1003 questionnaires were completed using a face-to-face survey procedure. According to Centre for Economics and Business Research, in this types of research, sample of 1000 is a robust sample size [25]. The target population was people living in Khartoum and Gadaref States in Sudan. The sampling approach was based on the availability of participants. Although availability sampling is a non-probability technique, the authors nevertheless attempted to be representative. This representativeness was supported by trying to use the available demographic and socioeconomic picture to predict the participant population required. This picture played a role in the sampling

technique that was used for this study. The initial availability sampling relied on those available participants who were willing to participate. As the study progressed, data collectors changed to a more purposive approach to sampling. However, there are no guarantees that either non-probability technique will provide a truly representative sample. Eligibility criteria were: being Sudanese; agreeing to participate; and aged above 18 years. Exclusion criteria were those who did not speak Arabic. The face-to-face interview technique was used as the method for data collection in order to maximize the response rate as well as to giving the data collectors a chance to explain the questions to the respondents. Data collectors were provided with a brief description of the construct dimensions and all items in the scale were clearly explained to them to assure consistency.

Before starting data collection, a formal permission letter was obtained from the Federal Ministry of Health in Sudan. Then, a number of considerations were adopted to ensure that no-one was negatively affected by conducting this study. First, during the consumer survey interviews, privacy was considered and respondents were verbally consented to be interviewed. The respondents were verbally informed that all data were for academic research purposes only. They were assured that the data processing would not be used to support decision making about them and no harm, damage or distress would be caused as a result of participation in the survey. Confidentiality was also assured, and the names of the respondents were not requested during the interviews. Last, but not least, the participants were informed that their participation was fully voluntary and the interviewees could freely opt out if they chose.

Results

In study 1, six Policy-Makers (PM) and five Community Pharmacists (CP) were interviewed after providing verbal consent (Table 1).

All interviewees without exception believe that people with high economic status are less vulnerable to counterfeit drugs than poor people. Some interviewees believe that education may make difference while others believe it does not. Most interviewees do not believe either age or gender may make difference in vulnerability to counterfeit drugs.

I believe age and gender have nothing to do with vulnerability to counterfeit drugs. Same for education as educated and non-educated people are same regarding knowledge about counterfeit drugs. Therefore, only economic status may make difference with regard to vulnerability to counterfeit drugs. (PM06) (Found in four).

If the consumer is poor and legitimate medicine is unaffordable to him, then he will have no choice other than going to non-legitimate, may be counterfeit, affordable medicine regardless he is educated or not. (CP05) (Found in four).

In study 2, and as a consequence of the face-to-face survey procedure, a 100% response rate was obtained. All questionnaires were usable with no missing data (Table 2).

Statistical method of one-way ANOVA was utilized to study the influence of independent variables socio-demographic characters on the dependent variable intention to purchase counterfeit drugs. Hypotheses involve the difference in purchase intention of counterfeit drugs associated with each socio-demographic character in the dataset, categorized by age, annual income, working status, educational level and gender. If statistically significant result is returned by the ANOVA, post hoc testing was conducted to determine which groups within the socio-demographic character (e.g., which age groups) exhibit

	Location			Gender	
	FMOH	MOH KS	MOH GS	Male	Female
Policy-maker	2	2	2	6	0
Community Pharmacist	NA	3	2	4	1

Table 1: Demographic Profile of the Policy-Makers and Community Pharmacists.

Variable	Number	Response Information (%)
Age		
< 30	530	52.8
31 – 40	255	25.4
41 – 50	140	14.0
51 – 60	48	4.8
>61	30	3.0
Annual Income (US \$)		
< 1000	76	7.6
1001 – 5000	776	77.4
5001 – 10000	126	12.6
10001 – 15000	21	2.1
>15000	4	0.4
Working Status		
Unemployed	506	50.4
Unskilled day labor	57	6.5
Skilled day labor	65	5.7
Non-professional governmental employer	43	18.4
Professional governmental employer	185	4.3
Non-professional private employer	31	6.6
Professional private employer	66	3.1
Non-professional businessman	15	1.5
Professional businessman	15	1.5
Retired	20	2.0
Education		
Less than elementary school	73	7.3
Elementary school	157	15.7
Secondary school	387	36.6
graduated	386	38.5
Gender		
Male	472	47.1
Female	531	52.9

Table 2: Demographic profile of the second sample (consumers).

statistically significant variation. This procedure was accomplished for all the independent variables.

The first null hypothesis stated that there were no differences in Sudanese consumers' perceived purchase intention of counterfeit drugs based on age group. Results of the one-way ANOVA indicated that null hypothesis could not be rejected. All other null hypotheses could be rejected (annual income $F(4, 998)=6.255, p<0.05$; working status $F(9, 993)=2.402, p<0.05$; educational level $F(3, 999)=2.975, p<0.05$; gender $F(1, 1001)=11.595, p<0.05$). Tukey HSD post hoc test indicated that annual income groups USD 1001–5000 and USD 5001–10000 differed significantly in their perceived intention of counterfeit drugs purchase with higher vulnerability for lower income. Also it showed that professional private employer have lower vulnerability to counterfeit drugs than retired, and women have higher vulnerability than men, and graduated less vulnerable than those learnt only till the elementary school (Table 3).

Discussion

Combating drug counterfeiting is a complex issue with many

Variable		df	F	P
Age	Between Groups	4	1.1	0.362
	Within Groups	998		
	Total	1002		
Annual Income	Between Groups	4	6.2	< 0.01
	Within Groups	998		
	Total	1002		
Status	Between Groups	9	2.4	0.011
	Within Groups	993		
	Total	1002		
Education	Between Groups	3	3.0	0.031
	Within Groups	999		
	Total	1002		
Gender	Between Groups	1	11.6	0.001
	Within Groups	1001		
	Total	1002		

Table 3: Results of One-Way ANOVA test for behavioural intention according to socio-demographic character variables.

difficulties generating controversial debate. Nevertheless, the development of effective organizational and technical countermeasures requires thorough understanding of the mechanism of both supply and demand sides of counterfeit drugs. Unfortunately, currently, particularly in developing countries, most of the efforts are directed toward reducing the supply [10], while the demand oriented approach is still scarce [10,12,18,26]. This current study tries to address this gap by exploiting a qualitative and quantitative approach.

In study 1 the authors assumed that differences in demographic characteristics may cause difference in purchase intention of counterfeit drugs and pursued in-depth qualitative research with Sudanese policy-makers and community pharmacists and tried to investigate whether age, gender, economic status, educational level or working status may impact vulnerability to counterfeit drug in a developing country.

Unlike many previous studies which addressed the importance of demographic factors in the purchase intent of counterfeits [11,15,19], most of the interviewees believe that with the exception of economic status, all other demographic factors such as education, age and gender have no effect on counterfeit drug purchase decision. This may be due to the fact that counterfeit purchase is a complex phenomenon and could not be easily linked to one factor or another but, moreover, strongly affected by the broader cultural context [27-29]. For example, a study conducted in South East Asia found that education level has a mixed correlation with purchase intent of a variety of counterfeit products [11]. Other studies compared consumers from Hong Kong, Taiwan, Western consumers, and Chinese consumers revealed that underlying cultural attitudes create significant differences in consumer responses toward counterfeit products [18,19].

In study 2 the finding that economic status may have significant effect on purchase intention of counterfeit drugs was empirically supported. This belief is consistent with the previous literature. For instance, prior studies have found that consumers who purchase counterfeit products are of lower social status [3,11]. However, in study 2 a significant difference in purchase intention of counterfeit drugs was supported for all demographic characteristic groups (annual income, education level, working status, and gender) with exception of age groups. This is not consistent with some previous studies which found that while both age and gender had significant effect on intention to purchase counterfeit goods, education and income both had no significant effect on consumers' intention to purchase counterfeit goods [30]. However, it is logical for an individual with better education to have better working

status and, consequently, better annual income. Therefore, education, working status and annual income maybe, to some extent, dependent and, maybe, that is why they showed similar effect on consumer's purchase intention. However, regarding education, previous studies noted that education level has a mixed correlation which is dependent on the type of the counterfeited product [11]. Also it was reported that gender differences have no resulting difference in purchase behaviour of counterfeit products [3], while other scholar went further to state that any demographic difference will not create a variety of purchase behaviour [10]. Overall, findings throughout study 1 and study 2 were inconsistent, but however, though inconsistent it may be informative. That is to say these results may demonstrate, rather than inconsistency, that the views of policy makers and practitioners are different from those of consumers. This could have negative implications reflected in that interventions developed by those policy makers and practitioners will consider only their views about the problem and is unlikely to address the real problem.

Conclusion

Both study 1 and study 2 agreed on that economic status of consumers has a major role in increasing or decreasing vulnerability to counterfeit drugs in Sudan. Therefore, it could be concluded that in developing countries with similar context in general the economic status is the dominating factor affect vulnerability of consumers to counterfeit drugs. Marketing managers and public health officers could use this knowledge about consumers' vulnerability to counterfeit drugs to develop more fine tuned strategies to combat the problem.

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