PATIENTS' KNOWLEDGE, ATTITUDE AND PERCEPTION ABOUT GENERIC PHARMACEUTICALS IN KHARTOUM NORTH, TOWN CENTER, SUDAN.

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ABSTRACT

Introduction: This study, up to the best of our knowledge, is the first of its kind in Sudan. The low-cost generic pharmaceuticals secure the needed availability, affordability and accessibility for patients, especially in developing countries. The patients' knowledge, and positive attitude and perception towards generics, promote their trust, acceptance and the ultimate use. Objective: Main study objective was to explore the patients' knowledge, attitude and perception towards generic medicines. Materials and Methods: One hundred (n=100) purposively selected patients in Khartoum North, Town center, Sudan; were addressed with a structured, open to answer, pre-piloted questionnaire of twenty nine (29) questions. Result showed a young participants’ population (40.5 years), females were (62%). Majority (85%) had secondary schools education and above. Majority (68%) were aware of the differences between generic and branded medicines. Only (45%) didn’t believe in generics’ safety and effectiveness. Majority (80%) didn’t endorse price as a pressing reason for use of generics. Majority (81%) preferred branded medicines for severe ailments, and majority (52%) did not agree on generics substitution. Majority (65%) didn't rely on pharmacist's choice for their over-the-counter medications. Participants’ age and income had a significant correlation with their use of generics (P 0.000, 0.03). Conclusion: The study results suggest that the participants had good knowledge, but poor attitude and perception towards generic pharmaceuticals. Though medications' prices are main barriers to medications' accessibility, yet, they were poor considered by the participants.
**Recommendation:** A nation-wide campaigns for educating, coaching, and motivating patients, pharmacists, and prescribers about generics’ merits, shall be launched to encourage more use of generics.

**KEYWORDS:** Sudanese, patients, knowledge, attitude, perception, generics.

**INTRODUCTION**

Health care expenditure is worldwide continuously escalating. The budgets for pharmaceutical are equally soaring up, especially, in developing countries.[1,2] Almost one third of the world population has no access to their needed essential medicines.[3] In Sudan the Pharmaceutical expenditure accounts for 2.2% of the total GDP, which makes up to 36% of the total health expenditure. The budget for pharmaceuticals represents an economical burden to both individual patients and their communities.[4] To solve the problem of the availability, accessibility and affordability of patients to their needed medications, the World Health Organization recommended the formulation of the Essential Medicines List (EML), where a list of selected medicines of known quality, and cost that cover the majority needs of the population, is to be formed by experts considering the disease patterns prevailing in that country or region. Even rich countries are now adopting EML to reduce cost of treatment.[5] The prices of medicines in developing countries represent real challenge to the poor patients, even when they are far lower than same in developed world. It is worth noting that "Prices of medicines for innovator brand as well as generics were high in Sudan compared to international reference prices and to countries in sub-Saharan Africa, in spite of existing price regulations".[6] Out –Of- Pocket expenditure on health in Sudan was (2005) 98% of private expenditure on health, while the per capita GDP, 2005 was $ 776.[7]

The EMLs introduction ‘have resulted in higher availability of essential Medicines compared to non-essential medicines particularly in the public sector and in low and lower income countries’’. [8,9] The use of generic medicines in addition to the adoption of the EML, secures the availability, accessibility and affordability to both patients and their communities.[10] A generic drug is defined as "a drug product that is comparable to reference /brand listed drug product in dosage form, strength, route of administration, quality and performance characteristics, and intended use". It also has to be bioequivalent to its originator/reference brand counterpart.[11] Generics may differ from their branded counterparts in their excipients , color, shape, packaging and have lower -cost (20%-90%).[12] Doctors, pharmacists and patients are used to brand name medications, more than to
generics. Patients and consumers, in general lack the adequate awareness and knowledge about generics.\textsuperscript{[13]} Studies of patients/consumers’ knowledge, beliefs and acceptance about generic medicine, worldwide, had shown much variations.\textsuperscript{[14-16]} accordingly, the acceptance, use and satisfaction with generic, are crucial for the promotion of their use and the consequent enjoyment of their merits for patients and their communities.

Though generics represent about (80\%) of the registered medicines in Sudan, yet, they are under used.\textsuperscript{[17]} Patients' and consumers' awareness, knowledge, trust and acceptance of generic are pivotal for their increased use.\textsuperscript{[18]}

Shrank et al., 2011; Alrasheedy et al., 2014, reported a positive attitude of their study participants patient towards generic pharmaceuticals.\textsuperscript{[12,19]} Other researchers however, reported the opposite, and referred that to the poor patients’ trust and knowledge about generics.\textsuperscript{[19, 20]}

As generic pharmaceuticals secure the needed availability, affordability and accessibility of patients to their essentially needed medicines, their increased use becomes of paramount importance, especially for the developing countries, like Sudan.\textsuperscript{[21]}

Despite the aforementioned merits for both the patients and their communities, yet, the use of generics in Sudan is still suboptimal. The results of many Sudanese studies showed rather staggering figures for generics prescribing. The use of generics ranged from; 37.2\%, 43.6\%; 49.3\%; 19.5\%; 11.8\%; 51.2\%, which were evidently suboptimal (An average of 42.3\%, while the recommended optimal is 100\%).\textsuperscript{[22-28]}

Increased knowledge, attitude and perception of patients, physicians, pharmacists and other health care team members are proved to increase patients' acceptance, trust and use of generics.\textsuperscript{[29]} Patients knowledge, attitude, perception about generics, are effective determinants of their acceptance and the highly needed use.\textsuperscript{[19]} These important determinants for the promotion of generics use were not studied in Sudan. It, accordingly, was decided to conduct this study with the main objective of Exploring: Patients' knowledge, attitude, and perception about generic pharmaceuticals in Khartoum North, Town Center, Sudan.
MATERIALS AND METHODS

Study design
Descriptive observational cross-sectional study.

Study area
The study was conducted in Khartoum North, Town center, Sudan.

A convenient sample (100) was taken from potential participants (patients) attending the private and public medical institutions and community pharmacies.

Study population and study subjects
Adult patients aged >18 years with different socio-demographic characteristics and having at least one prescription at the time of selection, were considered eligible for participation.

Study variable
Age, sex, marital status, educational level, and economical status indicators of patients (occupation, accommodation, monthly income).

Sample size and sampling techniques
As it is a limitless population, and considering the time and budget limitations, a sample size of one hundred patients (n=100) was considered on purposive non-probability basis.

Data collection tools and methodology plan
A structured, open to answer questionnaire (appendix 1) was used to collect data from the potential participants (patients). The questionnaire was revised for face and content validity by the researcher and supervisor and piloted on 10 (10%) of the study population. The pilot study participants were not included in the main study population. The piloting helped making minor changes in the questionnaire. The questionnaire was translated into simple lay Arabic language (official native language) to ease understanding of participants. The questionnaire which was composed of twenty nine (29) structured, close-ended and open-ended questions, was divided into two parts: Part one, was designed to collect data on patients' socio-demographic characteristics; and part tow was designed to collect data on patients' knowledge, attitude and perception about generic medicines. The questionnaire was distributed, by the researchers personally, to the potential participants in their respective settings and were assured of their anonymity. Each potential participant was first well informed of the main study objective and requested to cooperate. Each was also informed that
he/she has the absolute right to participate or refrain. They were also, informed that by filling the questionnaire they are freely consenting for participation. A small number of the potential participants were totally or marginally illiterates. In such cases the researcher used to read the question and write down the answer and read it before the potential participant to endorse it. If the participants rise any comments and/or suggests changes to better express his/her answer, they were made and his/her final opinion secured.

**Statistical analysis**

Data were collected in the period from 15\(^{th}\) of May to 15\(^{th}\) July 2014, using a convenience sampling technique. Frequencies and percentages were used to express all results. Associations between the patients' socio-demographic characteristics variables and variables related to participant patients knowledge attitude and perception about generic medicines, were assessed using Chi-Square Tests. All statistical tests were conducted at a prior significance level of p<.05, using Statistical Package for the Social Sciences (SPSS) version 20.

**Ethical Consideration**

The participation of the studied patients was strictly voluntary. The potential participant's agreement to participate and practically filling the questionnaire was considered as a free informed consent. Anonymity of respondents was respected and preserved in the study. The objective(S) of the study was explained to each potential participant, and he/she was given the absolute freedom to participate or refrain.

**RESULTS**

**Table 1, (A): Demographic characteristics of the respondent patients.**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age: (years)</strong></td>
<td></td>
</tr>
<tr>
<td>19-29.</td>
<td>21(21%)</td>
</tr>
<tr>
<td>30-39.</td>
<td>20(20%)</td>
</tr>
<tr>
<td>40-49.</td>
<td>21(21%)</td>
</tr>
<tr>
<td>50-59.</td>
<td>19(19%)</td>
</tr>
<tr>
<td>60-69.</td>
<td>6(6%)</td>
</tr>
<tr>
<td>70-79.</td>
<td>6(6%)</td>
</tr>
<tr>
<td>80-89.</td>
<td>1(1%)</td>
</tr>
<tr>
<td>Missing.</td>
<td>6(6%)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Female.</td>
<td>62(62%)</td>
</tr>
<tr>
<td>Male.</td>
<td>38(38%)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 (B): Socio-demographic characteristics of the respondent patients.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodation:</td>
<td></td>
</tr>
<tr>
<td>Home with fixed material.</td>
<td>75(75%)</td>
</tr>
<tr>
<td>Home with non-fixed material.</td>
<td>24(24%)</td>
</tr>
<tr>
<td>Otherwise.</td>
<td>1(1%)</td>
</tr>
<tr>
<td>Origin of participants:</td>
<td></td>
</tr>
<tr>
<td>Algazira.</td>
<td>1(1%)</td>
</tr>
<tr>
<td>Kassala.</td>
<td>1(1%)</td>
</tr>
<tr>
<td>Khartoum.</td>
<td>93(93%)</td>
</tr>
<tr>
<td>Northern states.</td>
<td>1(1%)</td>
</tr>
<tr>
<td>River Nile.</td>
<td>2(2%)</td>
</tr>
<tr>
<td>Southern kordofan.</td>
<td>2(2%)</td>
</tr>
<tr>
<td>Monthly income:</td>
<td></td>
</tr>
<tr>
<td>300-500 SDG</td>
<td>27(27%)</td>
</tr>
<tr>
<td>500-1000 SDG</td>
<td>30(30%)</td>
</tr>
<tr>
<td>More than 1000 SDG</td>
<td>23(23%)</td>
</tr>
<tr>
<td>Without monthly income</td>
<td>20(20%)</td>
</tr>
</tbody>
</table>

Table 2: Patients' responses to questions exploring their knowledge, attitude and perception about generic medicines.

<table>
<thead>
<tr>
<th>Question</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have a chronic disease?</td>
<td>Yes</td>
</tr>
<tr>
<td>Do you know the difference between generic medicines and branded medicines?</td>
<td>61(61%)</td>
</tr>
<tr>
<td>Are you keen to use branded medicines?</td>
<td>68(68%)</td>
</tr>
<tr>
<td>Do you agree that generic medicines fit the income of vast majority of patients and satisfy their therapeutic purpose and intended safety?</td>
<td>61(61%)</td>
</tr>
<tr>
<td>Do you pay attention to the country source of your medicines?</td>
<td>68(68%)</td>
</tr>
</tbody>
</table>
prescribed medicine?
If the pharmacist substituted your brand medicine by a generic, will you accept it and you are assured and satisfied?
Do you believe that the expensive thing is always the better?
Would you like to add any information not mentioned in the questionnaire?

Table, 3: Patients' Preferences for Generics and Branded Medicines.

<table>
<thead>
<tr>
<th>Question</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>If your doctor prescribes branded medicine to you, would you always feel keen to get and use it or you will accept the generic?</td>
<td>41(41%)</td>
</tr>
<tr>
<td>If the disease is severe and critical, would you prefer a generic or a branded medicine?</td>
<td>3(3%)</td>
</tr>
<tr>
<td>If the patient is a member of your family or your dear, would you prefer to use branded or generic medicines?</td>
<td>2(2%)</td>
</tr>
<tr>
<td>When you need a medicine for simple medical conditions (that do not call for or necessitate doctor consultation), do you request your pharmacist generic or branded medicine?</td>
<td>7(7%)</td>
</tr>
</tbody>
</table>

Table, 4: Patients' Perceptions about Generics Medicines.

<table>
<thead>
<tr>
<th>Question</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you fully agree that generic medicines are effective, safe and do the same purpose as brand medicines?</td>
<td>28(28%)</td>
</tr>
<tr>
<td>Do you agree that generic medicines are not different from branded in the degree of safety (side effects)?</td>
<td>28(28%)</td>
</tr>
</tbody>
</table>

Table, 5 (A): Bivariate Analysis Results.

<table>
<thead>
<tr>
<th>Question .No.</th>
<th>Question</th>
<th>Gender</th>
<th>Age</th>
<th>Education level</th>
<th>Monthly income</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Do you know the difference between Generic medicines and branded medicines?</td>
<td>0.268</td>
<td>0.454</td>
<td>0.195</td>
<td>0.133</td>
</tr>
<tr>
<td>11</td>
<td>Are you keen for using branded medicines?</td>
<td>0.416</td>
<td>0.070</td>
<td>0.872</td>
<td>0.627</td>
</tr>
<tr>
<td>12</td>
<td>Do you see that branded and generic medicines are equal in quality and safety?</td>
<td>0.606</td>
<td>0.640</td>
<td>0.215</td>
<td>0.408</td>
</tr>
<tr>
<td>Ques. No.</td>
<td>Question</td>
<td>Gender</td>
<td>Age</td>
<td>Education level</td>
<td>Monthly income</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------------------------------------------</td>
<td>---------</td>
<td>------</td>
<td>-----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>13</td>
<td>Have you ever used generic medicines?</td>
<td>0.463</td>
<td>0.933</td>
<td>0.247</td>
<td>0.030*</td>
</tr>
<tr>
<td>14</td>
<td>If you prefer generic medicines is it because of their: Availability, price, quality or other reason?</td>
<td>0.082</td>
<td>0.266</td>
<td>0.845</td>
<td>0.002*</td>
</tr>
<tr>
<td>15</td>
<td>If your doctor prescribes branded medicine for you, would you always feel keen to get and use it, or you will accept the generic as a substitute?</td>
<td>0.449</td>
<td>0.729</td>
<td>0.895</td>
<td>0.842</td>
</tr>
</tbody>
</table>

Table, 5 (B): Bivariate Analysis Results.
Table 5 (C): Bivariate Analysis Results

<table>
<thead>
<tr>
<th>Ques. No.</th>
<th>Question</th>
<th>Gender</th>
<th>Age</th>
<th>Education level</th>
<th>Monthly income</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>If the pharmacist substitute your prescribed brand medicine to a generic, will you accept it and you are convinced and satisfied?</td>
<td>0.468</td>
<td>0.256</td>
<td>0.794</td>
<td>0.752</td>
</tr>
<tr>
<td>24</td>
<td>When you need a medicine for simple medical condition (that do not call for a doctor consultation), do you ask your pharmacist for a generic or brand medicine?</td>
<td>0.312</td>
<td>0.946</td>
<td>0.829</td>
<td>0.187</td>
</tr>
<tr>
<td>25</td>
<td>Do you agree that generic medicines are not different from brand in the degree of their safety (side effect)?</td>
<td>0.753</td>
<td>0.024*</td>
<td>0.736</td>
<td>0.670</td>
</tr>
<tr>
<td>26</td>
<td>Do you trust the pharmacist to choose your medicine or you are always keen to get what your doctor had prescribed for you?</td>
<td>0.401</td>
<td>0.022*</td>
<td>0.878</td>
<td>0.602</td>
</tr>
<tr>
<td>27</td>
<td>Do you belief that the expensive thing is always the better?</td>
<td>0.552</td>
<td>0.421</td>
<td>0.431</td>
<td>0.467</td>
</tr>
</tbody>
</table>

Participants' comments

1. What are the foundations on which the pharmacist dispenses generic medicine?
2. Two participants said In the case of absence of branded medicines I use generic medicines; it is an obligatory choice.
3. I hope that prices of medicines do not increase every day.
4. Three participants said the medicines that my doctor prescribed is the brand medicine and it is the better but I cannot afford it.
5. If some generic medicines are effective, it does not mean they all are effective.
6. Countries differ in the quality of the pharmaceutical industry America and European countries first, second India, Jordan, the Gulf, Syria and then Egypt
7. The pharmacist is a doctor who is only knowledgeable of the drug, as defined by our ancestors in folk medicine.
8. A generic medicine means is a copy instead of the brand medicine; you can call it similar medicine.

9. All the pharmaceutical companies should make drugs in the same quality and the pharmacist should dispense what was written by a physician specifically.

10. There can be generic medications for chronic diseases available in our country and the brand unavailable so the use of generic is inevitable.

11. The medicine prescribed by the doctor is the brand medicine.

12. The pharmacist should not prescribe any medicine without prescription because the pharmacy is not a super market.

13. Most pharmacies are business outlets.

14. Asthma is a chronic disease; you did not mention it in the questionnaire.

15. The doctor should write names of generic medicines in the prescription in case that brand medicines is not available.

16. There should be education to the patients about the quality of the drug and therefore maintain the health of citizens.

17. The medical council should be keen not to import or allow entrance of medicines that do not match with international standards whatever the manufacturer country may be.

18. Most patients take generic medicines because they are of low cost and only a few patients can afford branded medicines.

19. I read the leaflet by myself to be assured of the medicines prescribed by the doctor or dispensed by the pharmacist.

Association between respondents' demographic criteria and their knowledge and beliefs on generic using a prior significance level of p<.05.

No single variable was found to be associated with participants' knowledge on generic except those marketed with * which means statistically significant correlations.

**DISCUSSION**

The response rate was 100 (100%). The results of the demographic characteristics of the participantpatients (Table, 1, A and B.) showed a high percentage of females 62(62%) than males 38(38%). This might possibly be because the researcher, who distributed the questionnaire forms, is a female, and that might have encouraged females to be more friendly, and willing to cooperate and participate. Females mostly feel more comfortable when they
interact with females. The dominating Islamic and oriental culture, in Sudan, restricts females' interaction with foreign males.

The low percentage of illiterate 7(7%) and primary education participants 8 (8%) might be attributed to the fact that participants with low education level were usually and generally not willing and may feel embarrassed to respond to written questionnaires compared to high school 34(34%) and university graduates 43 (43%). Sixty one 61(61%) of participants claimed that they know the difference between generic and branded medicines, but named them branded medicines as those medicines prescribed by their doctors! (Table, 2.) Other Turkish authors finding reported a low rate of knowledge of their participant patients about generics.\textsuperscript{[13]}

Understanding of the exact technical definition of a generic medicine (a medicine that contains the same active ingredient(s) and the same dose as the original brand but may contain different excipients and be marketed under a different trade name by a different company) is not commonly known by medicine consumers or patients, and most of them are either not familiar with the term, or had never heard it. Generics are usually presented to them by pharmacists as (Albadeel) an Arabic word denoting ‘not the original’ and/or ‘the substitute’, which may be taken to mean ‘not authentic’. Moreover, slightly less than 80(80%) of the generic medicines registered in Sudan are generics, mostly holding branded- generics names. This might be confusing to patients, even more. Therefore, the understanding or familiarity with the term (Generic) does not necessarily mean that the patients and consumers can easily differentiate between brand and generic medicines. Astonishingly, a study by Louhaichi and Rizgalla, 2014 reported that only (6.47%) of their study participants doctors versus (35.5%) of pharmacists knew the exact definition of generic drugs.\textsuperscript{[30]} Moreover, the term generic, it self, is new to the general public and as reported in other European studies, they quite frequently confuse it with the word genetic.

Half of the participants 50(50%) of this study mentioned that they had used generics before, even though, the majority 68(68%) reported that they are keen to use the branded medicines. There was no significant association between the participants' chronic disease state and their keenness to use branded medication.

(p value=.0.591). Experience does not always lead to repeated use. This can be explained by the fact that despite their trial, the patients were not happy and convinced with generics' effectiveness and safety.\textsuperscript{[15]}
One of the important factors for successful generic substitution, is patients’ understanding, knowledge, positive perception and trusts that generics are products with the same quality as brand-name drugs and not only cheaper alternatives to brand-name drugs.

Two thirds of participants showed (Table 4) negative perceptions towards generic medicines and subsequently negative attitudes towards generic substitution. This result closely matches the findings of a Brazilian study. Participants negative perception about generics mainly includes worries about the inferior quality of generics (due to the lower price), decreased effectiveness and safety of, doubts about the bioequivalence of the generic medicines compared to their branded medicine counterparts, and uncertainty due to changes in some physical attributes of the generic product compared to its branded counterpart, e.g. color, size, shape, packs, etc. Negative attitudes and perceptions towards generics were not associated with participant's gender, education level, or participants' monthly income. A study from Ireland reported that patients equated low price of generics and their inferior quality. Both drug effectiveness and safety have important and paramount impact on patients' selection of their medicines. Results (Table 4) showed that nearly 45% of the participants believed that generic medicines have low efficiency compared to their brand counterparts. In addition, 44% of them felt that generic medicines may cause more side effects than branded ones. This can be attributed to the fact that participants had felt that, because of their lower potency, generics must be made more "stronger" to be equally effective as the brand-name drugs, and that might be the cause behind the more side effects they experienced. One third of participants in this study (Table 5), were not aware of the differences between generic medicines and brand medicines, including aspects such as quality and safety. Almost one third of participants were not knowledgeable about generics. There was no association between the education level of the participants and their beliefs that generics are equal in quality and safety like branded medicines (P=0.215). Bulsara et al., 2010, conducted a qualitative study in Western Australia to explore the perceptions and views of patients' on generic medicines. Their study findings showed that many participants mistrusted generic and were confused about them. Some participants believed that generic medicines are of inferior quality compared to their brand medicines counterparts.

Using generic medications for chronic diseases is known to provide efficacy similar to that of brand-name medication use, but at a lower cost, which potentially enhances adherence, as affordability is linked to adherence, especially for long standing ailments. However, the
seriousness of the medical condition was an influencing factor on participants in preferring to use originator medicines in severe conditions (65%), while a considerable number of participants in this study 61(61%) preferred to use generic medicines for minor ailments, only (Table, 3).

This result is matching to the opinion of the Participants, in a study conducted in Alabama, USA. Where they reported being unwilling or hesitant to accept generic medicines for serious diseases, e.g., hypertension and cancer, but were willing to use them for minor illnesses, e.g., allergies and colds. [35]

Though 61(61%) of participants in this study agreed that generic medicines fit the income of the vast majority of patients, yet, an overwhelming majority 85(85%) of them reported that they prefer to use branded medicines, if the patient is a member of their family, although 51(51%) pay the cost of the treatment out-of-pocket, compared to 27 (27%) who were insured. This reflects a very high regard and trust on branded medications. It is important that patients know and appreciate the other advantages of generic drugs such as the effectiveness, safety, availability, affordability and accessibility of the drugs, rather than seeing them just as cheap medicines. Correct understanding and appreciation of generic medicines various merits could lead to positive attitude towards them. Shrank et al; 2011, conducted a nationwide survey with commercially insured patients in the USA, where (94%) of the participants believed that generic medicines are cheaper than their counterpart brand medicines. [12]

More than 70% believed that generic medicines are better value than brand medicines. Though, these two facts reflected appreciation for generic medicines, yet only 37.6% of them preferred to use generic medicines for themselves. Medication costs are not the casting factors for patients’ acceptance and the consequent use of generics. Fifty three (53%) of the participants in this study reported that quality and price are the benefits that they look for in their medicines, while only 3(3%) look for price, alone. This result showed that price (affordability) was of least concern or attraction for the majority of participants, though the majority were of low income social status. [36] This finding may be explained by the fact that, patients might have thought that less expensive medicines might be of lower quality, decreased efficacy, safety, and might be more costly if they do not prove effective and safe. [37] In contrast, a study from Jordan identified the cost as a major reason for acceptance of generic medicines. [20] Patients' confusion due to differences in price between branded and
generic medicines was a major reason for refusing generics. Participants might had thought that the lower price of generics is synonymous with poor quality.\textsuperscript{[14,38]} This notion is also an integral attribute of our Sudanese culture. A study carried in Sudan to analyze price discrepancies and their impact on rational use of medicines, confirmed that originator brands were the highest in cost compared to their generics counterparts, an extra burden.\textsuperscript{[39]}

A Study from Ireland, reported that a majority of participants asserted that they will use generics if prescribed by their GP.\textsuperscript{[15]}

But, prescribers, worldwide are lured by the pharmaceutical industry promotional tactics and claims, and are not aware that even the research companies can produce low quality products.

The multinational drug companies kept, and are still continuously, claiming that their products’ quality is unquestionable. But, many a times these claims fall short of holding stance in face of the truth.\textsuperscript{[40-46]} Prescribers need to appreciate the cost of medications as an important factor when prescribing.\textsuperscript{[47,48]} It is worth mentioning that the generic medications represent an average of around 64.8\% (by volume) of the pharmaceutical prescriptions in the USA, Germany, The UK, New Zealand, Denmark, Slovak Republic and Japan.\textsuperscript{[49]} Prescribers in developing countries would have dropped their hesitations and joined the big club, had they known of these facts and figures.

In 2012, The German Big Pharmaceutical company, Bayer, was charging $ 4500/month for their kidney and liver cancer medicine, while the generic equivalent, marketed by the Indian company Natco, was sold at 97\% less than Bayer’s price!\textsuperscript{[50]} Moreover, a study of 38 published clinical trials that compared cardiovascular generic drugs against their equivalent brand names showed no difference in safety, or effectiveness.\textsuperscript{[51]} Despite such results, physicians, in general, are still having rather a negative perception about generics.\textsuperscript{[52]} According to Shrank et al., 2011; generic medications are supposed to be welcomed by prescribers, pharmacists and patients.\textsuperscript{[32]} Their availability and affordability make them strategic alternative for the governments and third part payers in securing easy access to quality essential medicines, especially in the developing countries, like Sudan. Hassali, et al; 2009, in their literature review recommended “mass educational efforts, financial incentives and greater communication among patients and health care professionals” to increase consumers’ knowledge and trust in generic medicines in addition to financial incentives.\textsuperscript{[36]} This might indicate that both physicians and pharmacists can play...
an important role in increased use of generics. In Portugal, (88.7%) of participants in one study, asserted that they would accept generic substitution based on their physician’s recommendation, and/or pharmacist’s recommendation (64.5%).[29] Physicians and pharmacists remain as trusted health professional by patients. But both of them, as mentioned above are mostly highly affected by the pharmaceutical industry promotion. They accordingly, mainly support branded pharmaceuticals.[53]

A Sudanese study carried out to determine the quality of medical prescription in Ribat University Hospital, Khartoum; reported a very low (19.5%) rate of generic prescribing.[54] Another Sudanese study conducted to analyze the quality of prescription writing of doctors in outpatient departments of pediatric teaching hospital in Khartoum, shows that omission of generic name was found in 60.6% of prescriptions.[55] Forty six (46%) of participants in this study reported that they would trust the pharmacist to choose their medicines. This result shows that the pharmacists can also be pivotal in campaigns to enhance generics use, based on confidence conferred on them by patients. In general, pharmacists have a positive perception towards generic medicines and also a positive attitude towards generic substitution. A study in New Zealand revealed that 70% of the participating pharmacists stated that they did not perceive any difference in safety between originator and generic medicines.[56] But still, other studies reported pharmacists’ and physicians’ differing attitudes towards generics, despite their awareness about their benefits.[57]

Moreover, a minority of pharmacists had concerns about generic medicines and generic substitution. These concerns were related to their perceived inferior quality of generic medicines, patient confusion due to generic substitution, changes in therapeutic outcomes and differences in side-effect profiles. Moreover, patients’ preferences for originator medicines could represent a barrier for the pharmacist freedom to perform generic substitution.[58]

Forty eight (48%) of the participants accepted the pharmacist’s substitution offer, while 52(52%) did not.[59] Communication and coordination between physicians and community pharmacists for the benefits of patients and their communities are always needed.[60] The needed collaboration helps to educate, convince and encourage patients about generic substitution as it helps in preventing confusion, doubt, and concern among patients about the process of generic substitution, given that patients are often faced with a situation in which the physician is prescribing “something” and the pharmacist is offering “another thing”. Such situations make some patients feel, not only, doubtful and reluctant to accept a generic
medicine, but also psychologically uncomfortable even after accepting the generic medicine, which could influence their adherence with medication.[61]

CONCLUSION
The results of this study suggest that participant patients in Khartoum north, town center; had a fairly good level of knowledge, but poor attitudes and perceptions, towards.

CONFLICT OF INTEREST
The researchers had no conflict of interest to declare.

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