

Difficulties Faced By Pharmaceutical Industries Associated With COVID-19 Pandemic in Obtaining Raw Materials for Production of Certain Drugs in Sudan in 2021

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ABSTRACT

Background Pharmaceuticals industries play a significant role in health care, especially in developing countries and under-developing countries since it produced more affordable medications. Many factors contributed to ensure continuous production flow, the key factor is the availability of raw material. After COVID-19 outbreak scarcity in raw material became a major obstacle in drug production. The goal of this study is to identify barriers faced by pharmaceuticals industries in Sudan in acquiring raw materials due to COVID-19 pandemic. Method An analytical, qualitative structured focus group discussion (FGD) was performed with major factories in Khartoum, Sudan. To address issues regarding obstacles faced by this factories during COVID-19 pandemic. Result All participants' encountered problems because of the pandemic such as fuel shortage, difficulty in transportation, economic instability but the biggest issue was the closure of international borders that resulted in insufficient raw materials and other essential chemicals needed in production. Conclusion overall COVID-19 had a marked impact in drug manufacturing in Sudan which is reflected in the availability of drugs locally.

KEYWORDS: covid-19, Sudan, pharmaceutical industry, raw materials, pharmaceutical industry

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I. INTRODUCTION

COVID-19 pandemic also known as coronavirus pandemic is an ongoing pandemic caused by viral infection of respiratory system, a new class of corona virus was responsible for occurrence of this disease. First case reported was from Wuhan, Hubei province, China. The world health organization (WHO) announced the wide world spread of coronavirus on 11th March 2020 COVID-19 as a global pandemic. Statistics of WHO shows that 232,075,351 cases reported globally, and 4,752,988 deaths (as of September 29, 2021). Here in Sudan the total confirmed number of cases was 38,245 with 2,842 deaths, (as of September 28, 2021). The rapid spread brings out a sequence of challenges in term of health, economic, environmental and social aspects ⁽¹⁾.

Pharmaceutical industries are essential component in health care system in Sudan specifically and world widely. It is

based upon scientific researches and development of drugs that prevent or treat diseases. Drug production is the process of industrial-scale preparation of pharmaceutical medications by pharmaceutical companies ⁽²⁾.

Defect in any part of manufacturing impact both quality and quantity of the final products ⁽³⁾.

The increase in covid-19 cases in Sudan resulted in national lockdown as a prevention method to reduce the spread of the disease which was also applied in many countries worldwide, On the other hand this lead to serious decreased in medicines and medical supplies. One of the measures of lockdown was closure of international borders, which affected the production of medication by local companies, this is due to decline in the importation of raw materials and other necessary product such as chemicals needed in Quality Control departments to ensure good manufacture processes. And since shortage in local manufacturing is the main

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obstacle to medication availability in Sudan and many other counties of Sub-Saharan Africa, this contributed significantly in drug shortage during covid-19 pandemic ⁽⁴⁾.

II. METHOD

An analytical, qualitative structured focus group discussion (FGD) was performed with a number of major factories in Khartoum, Sudan to discuss in general, production processes followed by pharmaceutical factories before the pandemic and the impacts of COVID-19 in obtaining raw materials needed in medication production. Moreover information about production line was also collected.

III. RESULT

A focus group discussion was done with the head of the four major departments (production, quality control, quality assurance, and marketing). They concluded the following points:

- The process of drug manufacture as followed by local factories:
 1. Estimation of the market demand this is done by sales department
 2. Annual plan was designed to know types and quantity of drugs will be produced
 3. Order raw material from trusted companies mainly in India and China, this is done using digital programs
 4. Arrival of raw materials to quarantine areas in storage department
 5. Random samples are collected for QC analysis
 6. After approval, raw materials are stored ready to be used in production
 7. Production process
 8. Random sample analysis of final products in QC departments
 9. Packaging
 10. Finish products are transferred to store to be distributed to the market.
- All agreed that COVID-19 pandemic had a significant impact on drug manufacturing in Sudan. The most remarkable was the decrease in production. The effect was:
 - Deficiency in energy sources including both electricity and fuel which are the drive force of factories resulted in:
 1. Inability to operate machines essential for manufacturing
 2. Incapable to transport personnel from and to the factory
 - Economic instability
 - Rarity in protective equipment such as: gloves, facemask, and head cap, etc.
 - India and China are the major raw material sources in Sudan. Insufficiency due to closer of international borders, lockdown, and governmental policies in these

two countries resulted in raw material shortage and surge in price.

- It is mentioned that factories used to keep enough stock of chemicals and raw materials since Sudan fluctuated economic status. This strategy contributes to solve problems encountered by the COVID-19 pandemic. Especially in quality control (QC) departments.

IV. DISCUSSION

Sudan is an underdeveloped country struggling with economic instability which is considered one of the major factors that affect drug production in general. After coronavirus was announced as a global pandemic. Pharmaceutical factories faced many struggles in producing medications, scarcity of raw material was the strive reason which put a stop to drug production.

Hence China and India are considered as the main supplier for pharmaceutical raw material worldwide. The interviewed drug makers' order their raw materials and other pharmaceutical and chemical materials essential for drug manufacturing from them.

China being the epicentre of the pandemic and the first country to enforce lockdown measures this led to shutdown in international export/import movement. Moreover, prices of raw materials rose. Besides, India as second source of raw material was also influenced by China's policies. This handicapped the production process in India itself, furthermore, with the spread of coronavirus in the country, India's government decided to insure self-sufficient of medication as a strategy to overcome predicted emergencies.

Another factor which contributed to shortfall in drug production in Sudan during the COVID-19 pandemic was fuel crisis. This resulted in unstable electrical current, which impacted negatively on the production process. Secondly, difficulty in transporting personnel lead to staff shortage that also slowdown the production process.

Factories faced issues in obtaining protective equipment such as facemasks, gloves, and head cap, because at that period of time there was high demand on this equipment. Since WHO announced facemask, gloves, and social distancing to be the first line methods against the coronavirus spread before the vaccine development.

V. CONCLUSION

The shortfall of raw materials as mention above was the major obstacle in drug production, the reason behind that was importation problems arising from policies that government enforced worldwide during the COVID-19 pandemic as a protection measures.

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