

## PHARMACISTS' PERCEPTIONS ON FACTORS CONTRIBUTING TO STOCK-OUTS OF ESSENTIAL MEDICINES AT A TERTIARY HOSPITAL IN SOUTH AFRICA: A QUALITATIVE CROSS-SECTIONAL STUDY.

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### ABSTRACT

#### Background

Essential medicines are one of the vital components in the provision of health services and their availability plays a crucial role in the reduction of mortality and morbidity associated with disease burden. Despite the committed action plans and several initiatives by the South African National Department of Health, there are ongoing medicine stock-outs at public health facilities across the country and this affects thousands of people. To explore this problem, this study explored pharmacists' perceptions about factors contributing to stock-outs of essential medicines at a tertiary hospital in South Africa.

#### Methods

A qualitative cross-sectional study was conducted among pharmacists at a tertiary hospital in South Africa. Participants were purposively sampled and due to data saturation, 8 pharmacists participated in the study. Semi-structured, face-to-face interviews were used to collect data. Interviews were recorded and transcribed verbatim and analyzed using Tesch's open coding process. Trustworthiness of data was measured through transferability, confirmability, credibility, and dependability.

#### Results

The participants included five procurement pharmacists, one stock controller pharmacist, one receiving pharmacist, and one contract pharmacist. All participants held a Bachelor of Pharmacy degree. Shortage of resources coupled with poor procurement processes affected the availability of medicines and hampered service delivery. Inconsistent deliveries from the Provincial Pharmaceutical Depot to hospitals and clinics as well as poor communication between stakeholders were also perceived as factors contributing to stock-outs of medicines.

#### Conclusions

Medicines supply chain management within the hospital has several gaps and shortcomings. The hospital should invest in strengthening the procurement and supply chain processes to ensure the availability of medicines.

#### Recommendations

To improve the availability of essential medicines, pharmacists and supply chain officers should receive continuous training on procurement processes. Formal communication forums to address challenges encountered in the provision of essential medicines should be established and sustained.

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**Keywords:** *Essential medicines, Stock-outs, Hospital, Pharmacists, Procurement, Supply chain.*

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### INTRODUCTION

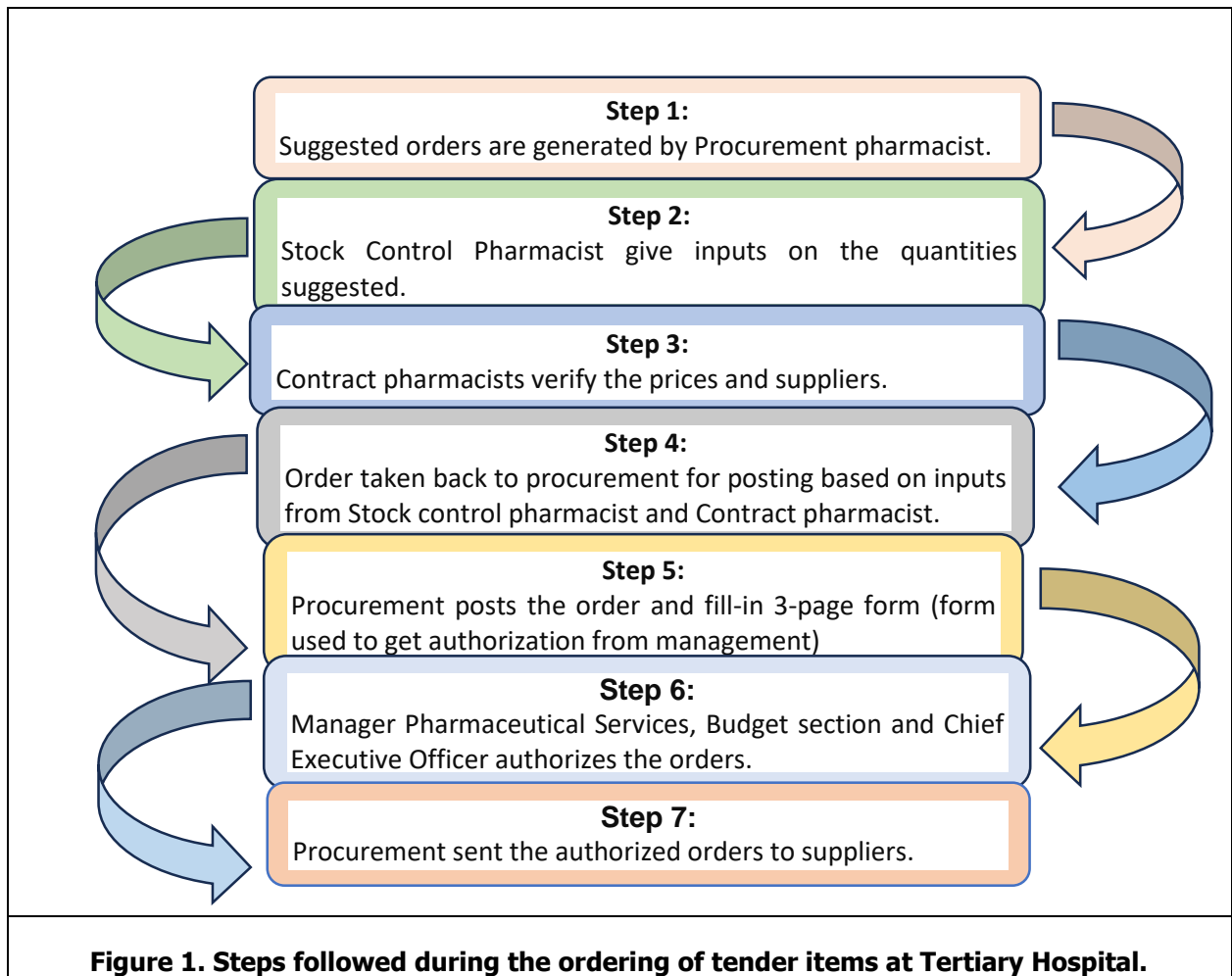
Medicines are an important building block of a health system and can be classified as either essential or nonessential. Essential medicines are those medicines that fulfill the population's priority healthcare requirements and contribute to the efficient functioning of the healthcare systems and are selected based on disease prevalence, proof of clinical efficacy, safety, comparable costs, and cost-effectiveness while non-essential medications are those with high costs but little to no clinical advantage over equivalents.[1] This paper focuses on essential medicines. Essential medicines are important

in the delivery of health services and their uninterrupted supply helps to reduce morbidity and mortality in the population.[2] However, stock-outs of essential medicines are a global public health problem.[3,4] Stock-outs of medicine refer to the physical unavailability of the required medicine to be given or administered to a patient within 24 hours.[5] Due to the complexity of the causes of stock-outs of essential medicines and the potential differences between countries, many approaches to addressing them may be necessary.[6] Like many other countries, South Africa has been experiencing stock-outs of essential medicines for managing communicable and

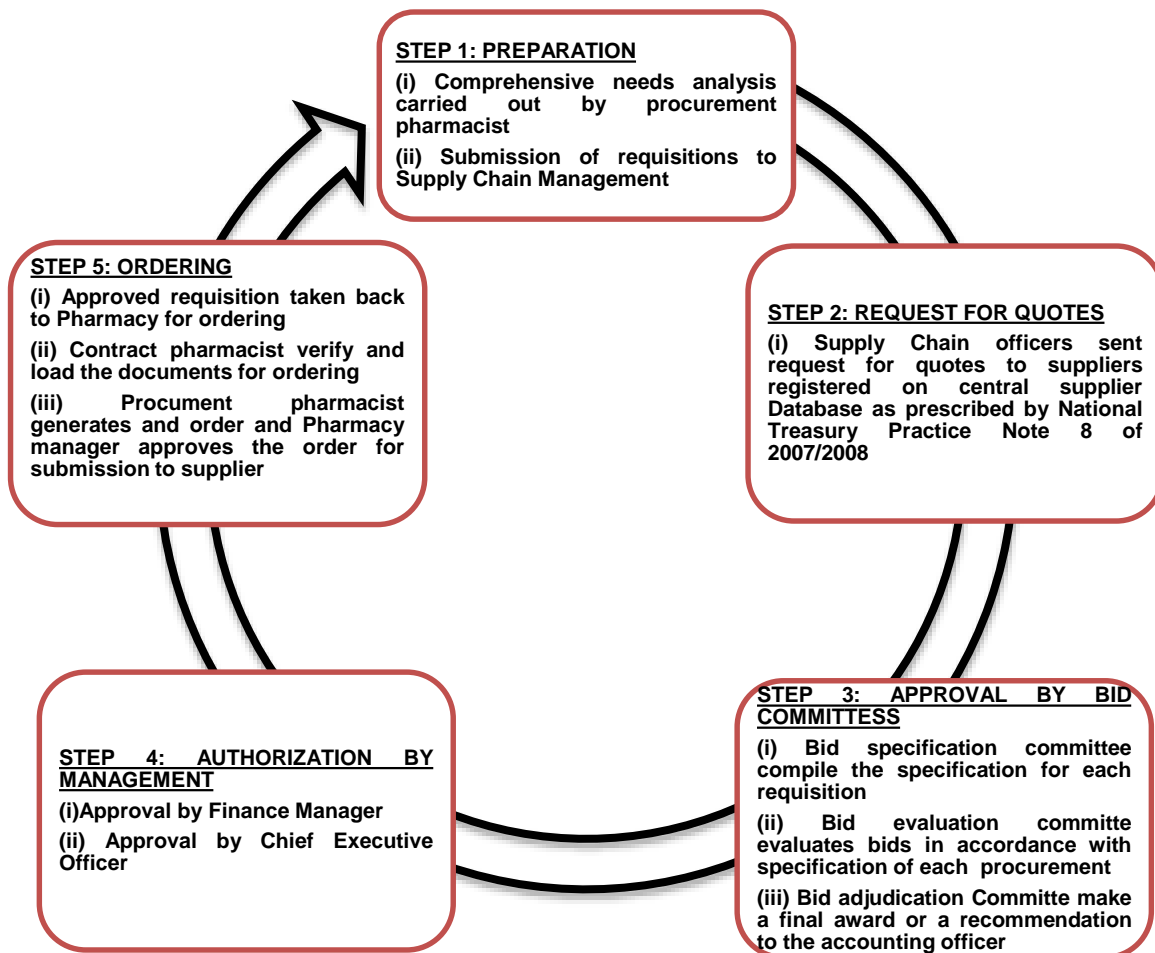
non-communicable diseases within the public health sector.[7] Stock-outs of essential medicines are occurring across South Africa and are not limited to medicine for acquired immunodeficiency syndrome (AIDS) and tuberculosis (TB) but extend to other essential medicines for chronic diseases.[8,9]

In South Africa, procurement of medicines in the public sector is a centralized function and it is managed by the National Department of Health through a pharmaceutical tender system.[7] Pharmaceutical tendering refers to the bulk procurement of medicines by a central buyer at contracted suppliers over a specific contracted period following a confidential bidding process.[10] The province in which the tertiary hospital is situated has a pharmaceutical depot responsible for the warehouse and distribution of medicines. Based on the memorandum of understanding entered between the Provincial Pharmaceutical Depot (PPD) and the Provincial Health Care facilities, PPD is responsible for the procurement, storage, and distribution of pharmaceuticals and medical

suppliers to hospitals, Primary Health Care (PHC) facilities, and Community Health Care (CHC) centers. Even though this is how most medications are delivered, tertiary hospitals use the direct delivery voucher (DDV) from contracted suppliers. The hospital in this study uses DDV, where the medicines are procured using the Rx solution® and are directly delivered to the facility by suppliers or distributors. Rx solution® is a software program introduced in public health facilities in South Africa to control stock within the facilities.[11] The following outlines the steps followed during the ordering of tender items at the hospital: Not all the items are available for procurement through a tendering process.[7] In such cases, the hospitals rely on the buy-out approach (quotation process) to procure essential medicines that are not on tender.[12] In this study, the process of buying out within the hospital is done through Supply Chain Management which is a separate section from pharmacy. The following outlines the steps followed during the ordering of quotation items:



**Figure 1. Steps followed during the ordering of tender items at Tertiary Hospital.**



**Figure 2. Steps followed during the ordering of quotation items at Tertiary Hospital.**

Even after the National Drug Policy and the essential drugs program were introduced in 1996, stock-outs of essential medicines continued to be a problem in all public health facilities in South Africa. [13-15] Tayob [16] indicates that Kgalagadi District in Northern Cape Province and Mopani District in Limpopo province, respectively had a problem with medicines stock-outs and reasons for these stock-outs were not identified. Zuma [17] also indicates that Limpopo, Gauteng, Free State, Eastern Cape, and Mpumalanga provinces are among the nine provinces where the availability of TB and Anti-retroviral (ARV) medication was found to be less than 95%.

South Africa continues to experience stock-outs of essential medicines in public healthcare facilities.[18] Despite several innovations and plans by the South African National Department of Health, medicine stock-outs at public health facilities across the country persist and this affects thousands of people who depend on public health facilities for their well-being.[9,18,19] The authors observed through weekly stock-outs reports and

amendments of the original written prescriptions reports that a tertiary hospital in South Africa has been experiencing stock-outs of essential medicines for a long time. In some cases, the hospital amended the original written prescriptions but sometimes treatment delays occur when prescriptions are amended. To the author's knowledge, there has never been research on the causes of stock-outs of essential medicines at this affected hospital. The aim of this study was therefore to explore pharmacists' perceptions of factors contributing to stock-outs of essential medicines at a tertiary hospital in South Africa.

## METHODS

### Study design and setting

The study used a qualitative cross-sectional research design.[20] This qualitative research method was appropriate as it allowed the researchers to explore and understand pharmacists' perceptions of factors contributing to stock-outs of essential medicines. The study was conducted at a tertiary hospital pharmacy in South Africa. The pharmacy had two divisions, namely the Warehouse and Dispensing divisions. Within the

Warehouse division, there are four sections: procurement, receiving, distribution, and contract section. The dispensing section also has four sections: dispensary outpatient, pediatric, eye, and Anti-Retroviral section.

### Population and sampling

The population consisted of 21 pharmacists working at the Warehouse and Dispensing division of the pharmacy. A purposive sampling technique was used to obtain pharmacists believed to be rich with information to ensure that appropriate data was collected.[21] Therefore, 12 pharmacists were purposively selected as they had the knowledge and experience with procurement of medicines, receiving of ordered medicines, control, and management of stock within the hospital. Data saturation was reached by the 8th participant when no new information emerged.

### Data collection

Data was gathered through semi-structured, face-to-face individual interviews with selected pharmacists using an interview guide. The following central question was posed to the participants and followed by a series of probing questions that were informed by their responses: *“Stock-outs of essential medicines is a problem at this hospital, what do you think are the contributory factors?”* With consent from participants, interviews were audio recorded, and field notes were collected.[22] Participants were interviewed one by one by the first author (TA) until saturation of data was reached.[23] Demographic details of participants such as qualifications, job position, placement in the pharmacy, and number of years working as a pharmacist were also collected from each participant.

### Data analysis

Once saturation of data was reached, the first author (TA) transcribed the voice recordings verbatim and prepared transcripts for thematic analysis. Field notes were added to each transcript and Tesch's open coding technique for thematic analysis as explained by Creswell,[24] was employed through the following steps: arranging and preparing the data for analysis; reading through the entire set of data to get a sense of what it includes and possibly its broader meaning; organizing the data and labeling each section with a term that denotes a category; providing thorough explanations of the background and the participants and describing the categories or themes for analysis; narratively presenting the results to communicate the analysis's conclusions; and interpreting the results of the analysis.[24]As this paper is based on the Master of Public Health (MPH) research project of the first author, identified themes and subthemes were verified by a second author (SF) who was the supervisor of the research project. Transcripts and field notes were sent to an experienced independent coder to ensure the credibility of the study. The authors and the independent coder held meetings and reached a consensus on the final themes and subthemes.

### Strategies to enhance rigor

Transferability, credibility, dependability, and confirmability were employed as techniques to ensure trustworthiness.[24,25] To ensure the credibility of the study, the following strategies were implemented: The study was undertaken after ethical approval from the university's ethics committee. The data collected was cross-checked with the participants during the interview process to ensure that what will be reported represents the views of the participants. During the interview process, the first author (TA) frequently summarized the shared information and asked for clarifications to confirm the accuracy of the information. As part of the studies for the Master of Public Health degree, the first author completed a module in research methodology. Furthermore, the research was guided throughout by a supervisor (SF) who is competent, qualified, and experienced in qualitative research. To ensure the confirmability of the data, all authors were involved in the study's design, analysis, and team discussions to promote agreement with the findings of the study. To confirm the findings, an independent coder who is competent in qualitative research and knows how to analyze qualitative studies was used. Transferability of data was established by providing a comprehensive description of the study design, setting, participants characteristics, data collection and analysis process, and results. Dependability criteria were ensured through an audit trail of audio-taped text, field notes, and transcriptions.

### Ethical considerations

As the study was for an MPH research project, ethical clearance was granted by a university research ethics committee (TREC/203/2018: PG) before the commencement of data collection. In addition, authorization to conduct the research at the hospital was subsequently obtained from an appropriate health research committee of the Department of Health (LP201812\_002). To obtain informed consent, participants were informed of the study's purpose, the confidentiality of the information they provided, and their right to withdraw from the study at any time without providing reasons. The Standards for Reporting Qualitative Research (SRQR) was used as a guiding tool to enhance transparency of all sections of the study. [26]

## RESULTS

### Participant's characteristics

Altogether, eight pharmacists who were positioned at different sections in the pharmacy were interviewed and distributed as follows: five procurement pharmacists, one stock controller pharmacist, one receiving pharmacist, and one contract pharmacist. All participants held a Bachelor of Pharmacy degree. Five of the participants had an experience of over five years working as a pharmacist while the remaining three participants had working experience of between two to four years as a pharmacist.

**Table 1** summarises the participants' demographic information.

**Table 1: Demographic information of the participants.**

Participant Number	Job position	Qualifications	Numbers of years as a Pharmacist	Number of months/years' experience in Warehouse
P1	Procurement pharmacist	B Pharm	2 years	9 months (Procurement)
P2	Procurement pharmacist	B Pharm	20 years	3 years (Procurement)
P3	Procurement pharmacist	B Pharm	4 years	8 months (Procurement), 1 year (Distribution)
P4	Procurement pharmacist	B Pharm	4 years	6 months (Procurement)
P5	Stock controller pharmacist	B Pharm	10 years	2 years (Stock control), 2 years (Distribution)
P6	Contract pharmacist	B Pharm	12	3 years (Contract), 2 years and 8 months (Procurement), 13 months (Distribution)
P7	Procurement pharmacist (P7)	B Pharm	6 years	5 months (Procurement), 3 months (Distribution), 3 months (Stock control)
P8	Receiving pharmacist (P8)	B Pharm	8 years	1 year (Receiving), 6 months (Distribution)

### Themes and sub-themes

The study findings are presented in six themes which emerged from data analysis: (i) shortage of human resources at the hospital; (ii) inconsistent delivery of

medicines from pharmaceutical depot to hospitals and clinics; (iii) long procurement processes; (iv) poor inventory control; (v) supplier issues; and (vi) poor communication between stakeholders. **Table 2** summarises the emerging themes and sub-themes.

**Table 2: Summary of the themes and sub-themes**

Theme	Sub-theme
1. Shortage of resources at the hospital	1.1 Shortage of human resources. 1.2 Shortage of funds for procurement of medicines.
2. Inconsistent delivery of medicines from Provincial Pharmaceutical Depot to clinics and hospitals	2.1 Poor internet connection at Provincial Pharmaceutical Depot 2.2 Sharing of stock with clinics and other hospitals.
3. Long procurement processes	3.1 Long internal lead time for suggested orders 3.2 Long turnaround time for quotation requisitions
4. Poor inventory control system	4.1 Inaccurate maximum-minimum stock levels 4.2 Inaccurate quantifications 4.3. Increased number of patients
5. Supplier issues	5.1 Suppliers failing to adhere to contractual lead times. 5.2 Shortage of raw materials 5.3 Late payments of suppliers
6. Communication between stakeholders	6.1. Poor communication between doctors, pharmacists, and Supply Chain management 6.2. Poor communication between Pharmacy and suppliers

### Theme 1: Shortage of resources at the hospital

Some participants revealed that there was a shortage of procurement pharmacists responsible for ordering essential medicines. The shortage resulted in the few

available staff failing to cope with their daily duties due to overwhelming workload. Shortage of human resources was also quoted as a problem in Supply Chain Management (SCM), which is a separate section from the pharmacy and deals with quotation requisitions as outlined in Figure 2. This shortage of human resources in Pharmacy and SCM affected the availability of medicines and hampered service delivery:

*"So alone is impossible. So, I just told myself that I am going to try to prioritize where I can. Where I fail there is nothing I can do. Alone is not workable. You just...you just check what is urgent and you do it and the rest they end up falling off."* (P5)

*"They also have their challenges because this is another department that is doing the quotations...is the Supply Chain. They also have their challenges of shortage of staff, so it also affects us in the Pharmacy."* (P8)

The participants further indicated that the funds that were allocated under the categories Medicine Medical Depot Funds (voted funds) and Comprehensive HIV and AIDS Conditional Grant (for procurement of Anti-retroviral) were not enough:

*"The money was depleted. And the contributing factor for that is ARVs because for ARVs they have given us seven million and they almost cost double that amount."* (P1)

### **Theme 2: Inconsistent delivery of medicines from provincial pharmaceutical depot to hospitals and clinics**

Some participants indicated that the Provincial Pharmaceutical Depot (PPD) faced challenges with the new software (Warehouse Management System) used to control and manage stock. The software required an internet connection to manage daily operations such as ordering, receiving, and issuing of stock. Due to poor internet connection, some orders were not processed and delivered to hospitals and clinics as per plan:

*"The recent info that we got is because the system that the Depot is using is failing them, so they are unable to meet their delivery targets to the clinics."* (P6)

Participants further mentioned that when PPD failed to deliver stock to facilities, there were stock-outs at service delivery points, which then resulted in clinics and hospitals requesting stock from adjacent facilities:

*"The other contributing factor is also the requests by other hospitals because we are a tertiary hospital. So sometimes when the Depot has challenges with the delivery plan and out of stock, the hospitals around request stock from us and we do the same as well."* (P2)

### **Theme 3: Long procurement processes**

Participants reported that it took time for suggested tender orders to be processed and approved. Participants highlighted that the time required for organizational procedures to be completed for placing the orders as shown in Figure 1 is long and affected the availability of medicines:

*"...starting with the suggestion of the orders, to take it to contract, to take it to stock control, it takes long for the order to be generated. And then again, after generating the order, it takes long for the management to approve the orders."* (P2)

Concerns regarding the hospital's buy-out process (quotation process) as shown in Figure 2 were expressed by several participants. Several buy-outs that SCM had to handle were for essential medicines that were not on tender and the process for such buy-outs is very lengthy. Participants highlighted that the quotation requisitions submitted to SCM took too long to be brought back to the pharmacy for ordering and this affected the availability of medicines within the facility. Below are some narratives that illustrate the participants' concerns:

*"It is too slow for the quotation process to get approval. It can take months. Sometimes you can make a requisition today and then approval comes after 3 months. It is too long..."* (P4)

*"When you just say the item is on the quotation that's when the problem starts because that item you will wait for more than 3 months, you will wait for 6 months, you will wait for many months for the item to come."* (P5)

### **Theme 4: Poor inventory control**

Participants indicated that the minimum and maximum pharmaceutical stock levels that are set are not calculated or set correctly as quantities of available stock do not last for 8 weeks. The participants further highlighted that there is an increase in the number of patients reporting at the hospital and this therefore affected the set minimum and maximum stock levels:

*"Is not enough because it is not calculated well. The stock does not last for 8 weeks. You find that the stock last for 3 weeks or 2 weeks in certain instances..."* (P2)

*"And then also increased number of patients. You find that you have ordered 300 and you have more patients than what you have ordered. That will also contribute."* (P6)

### **Theme 5: Supplier issues**

Participants indicated that some designated suppliers influenced the availability of essential medicines within the facility because they failed to adhere to contractual obligations as items were delivered long after the agreed average period between placing an order and receiving the stock from the supplier. When delivery terms were not met by the suppliers, stock-outs of essential medicines occurred:

*"There are suppliers which perform badly because you will order an item then the item doesn't come for close to 2 months or 3 months."* (P1)

Participants further highlighted that one of the reasons forwarded by suppliers for non-delivery is problems encountered with the raw materials or Active Pharmaceutical Ingredients (API):

*"As far as I can remember some had challenges with active ingredients and some were telling us that the batch*

that they have ordered has not yet arrived since they were ordering it from somewhere." (P3)

"Because some items are difficult to get hold of. You may find that at the companies where we order they may not be having enough stock, or they are having challenges with the ingredients or something like that." (P7)

Reflecting on the typology of reasons for stock-out of essential medicines, the pharmacists mentioned that the suppliers were not paid within 30 days after delivery of stock as per Section 38 (1) (f) of the Public Finance Management Act (PFMA) 1 of 1999 and Treasury Regulations 8.2.3. This late payment of suppliers then resulted in suppliers withholding the deliveries:

"Like towards the end of the financial year that is when we get those reports that supplier so and so is not paid. And the problem is that it does not only come from our hospital. It is the whole province. If Depot does not pay, then we are all affected." (P4)

Some participants who cited supplier non-payment as a contributing factor to stock-outs of essential medicines in the hospital further stated that suppliers that were not paid on time did not send the ordered stock and this had an impact on the availability of the essential medications.

"So, when we don't have the blank pages, we are forced to just pile the invoices. So, it affects us in such a way that the suppliers start to query their money. And then if we don't pay them, they don't supply." (P8)

## Theme 6: Communication between stakeholders

The study findings reveal that there was no frequent and active communication between pharmacists, doctors, SCM officers, and suppliers. Participants indicated that the committees which look at the rational use of medicines and those who look into procurement processes did not have meetings as planned and this contributed to the stock-outs of essential medicines:

"Pharmacy and our clinical services...we...we are not a team, so we do not know what they want. Whenever they want something they just come running here. When you check that item, we never kept it, and it was never communicated to anyone that it is needed." (P5)

The participants made it clear that the suppliers often did not notify the hospital beforehand of matters that might result in a shortage of essential medicines:

"We tried to communicate the queries regarding the stock that was delivered to us like short-dated, over-supplied, undersupplied, or damaged stock. So, whenever you communicate you find a different person. They take time to respond to your query and that contributes to the stock-outs." (P8)

## DISCUSSION

This study explored the factors contributing to stock-outs of essential medicines from the perspective of hospital pharmacists in a tertiary hospital. The study found that a shortage of human resources (pharmacists and SCM procurement officers) to manage the procurement of

essential medicines caused stock-outs of essential medicines and hindered service delivery. The shortage of the mentioned workforce means that the available pharmacists and SCM officers could not cope with procurement duties, and this affected the availability of essential medicines in the hospital. This highlights that the effectiveness of pharmaceutical services is directly dependent on the availability and performance of procurement pharmacists and SCM officers. The findings of the study further highlight that the funds which were allocated by the Finance department for the procurement of essential medicines were not enough. This means that the funds allocated under equitable shares and conditional grants (Medicine Medical Depot funds and Comprehensive HIV/AIDS Conditional Grant) were not enough to ensure sustainable procurement of essential medicines. The findings are similar to a study that found that a shortage of human resources is one of the factors contributing to stock-out of essential medicines.[27] The findings also concur with a study conducted in the Free State province of South Africa which found that one of the factors contributing to stock-out of essential medicines is a shortage of pharmacists and pharmacist assistants to manage placement of orders, to make follow-up of such orders and to monitor the stock levels.[28] A study conducted in Kenya and Tanzania found that shortage of funds at public hospitals caused stock-outs of essential medicines and strongly influenced the quality of services delivered as patients were frequently sent to buy medicines from their pockets from the private sector pharmacies.[29]

The study has also highlighted inconsistent delivery of medicines from PPD which is responsible for the procurement, storage, and distribution of essential medicines. Failure by the PPD to deliver essential medicines to PHC facilities and other hospitals resulted in such facilities requesting stock from the tertiary hospital. The frequent requests hurt the stock levels because the tertiary hospital did not plan for such requests. The results of this study support the findings of a study conducted in the Eastern Cape province of South Africa which found that during stock-outs of essential medicines, healthcare workers used different communication channels such as personal cell phones to share information on stock levels and redistribute essential medicines within the health facilities.[30] Similar findings were recorded in studies conducted in Uganda which found that during stock-out of essential medicines in resource-limited settings, health facilities borrow or share stock within their networks, especially those in close physical proximity.[31,32]

This study found that procurement processes within the hospital affected the availability of essential medicines. The process of ordering both tender and quotation items to meet the requirements of patients took a long time. The pharmacists reported being frustrated by the tender procurement processes and the hospital's buy-out processes. The lengthy and complex nature of the mentioned procurement processes caused stock-outs of

essential medicines in the hospital and therefore affected service delivery. The findings concur with a study that found that factors such as the length of time taken to prepare and approve requisitions, the lengthy process of using direct purchase, and lack of knowledge of rules and regulations of procurement affect service delivery. [33]

This study found that there are poor inventory controls within the hospital. Inventory management in pharmacy assists in maintaining the anticipated stock level of specific medicines to ensure that patients are provided with the most appropriate medication when needed.[34] The findings of this study are in line with a study that found that in facilities where minimum and maximum stock levels are not set such facilities are not able to determine when and how much to re-order therefore contributing to frequent stock-outs of essential medicines.[35,36] Poor supply chain management within public health facilities contributes to stock-outs of essential medicines which consequently affect disease control negatively.[37]

This study found that suppliers also contributed to stock-outs of essential medicines as they failed to adhere to contractual obligations as medicines were delivered long after the lead time had elapsed. During such prolonged lead times, suppliers failed to notify the hospital of the delay. The delivery of medicines should be made by the supplier by the terms and conditions specified in the contract. Some supplies withhold deliveries because of prolonged non-payment. This means that the Finance department did not abide by the payment schedule of 30 days as set out in the Public Finance Management Act. No penalties were imposed by the hospital due to the increased workload of available staff caused by staff shortages. The findings of this study are in line with a study that revealed that long and fluctuating supplier lead times are one of the key challenges that disrupt supply chain management.[38]

The findings also highlighted the shortage of active pharmaceutical ingredients from suppliers as a factor contributing to stock-outs of essential medicines. This may be because most raw materials are imported and there might be a limited number of raw material suppliers globally. However, requirements and conditions of the pharmaceutical contracts that are all subjected to General Conditions of Contract issued by Chapter 16A of the Treasury regulations highlight that contracted suppliers must inform the National Department of Health at first knowledge of any circumstances that may result in interrupted supply, including but not limited to any anticipated problems associated with the availability of active pharmaceutical ingredients. This finding concurs with a study which revealed that shortage of raw materials from the pharmaceutical companies form part of the factors contributing to stock-outs of essential medicines.[12,38] Shortage of raw materials is therefore a contributory factor to stock-out of essential medicines because final products rely on raw materials that are sourced from different countries, and should therefore

pass quality tests first before they can be used to produce the required product.[39] Poor communication between stakeholders was also perceived as a factor contributing to stock-outs of essential medicines. To minimize challenges with the distribution and supply of essential medicines, it is vital to maintain communication with all parties involved.[40]

## CONCLUSION

The perceived factors indicate that the supply chain systems and medicines management within the hospital have several gaps and shortcomings that affect the availability of essential medicines. Therefore, to improve the availability of essential medicines the perceived causes of stock-outs should be further investigated, and the hospital should strengthen the pharmaceutical procurement and supply chain systems. An improvement in the availability will be beneficial to patients in terms of health outcomes and will therefore reduce all negative impacts associated with stock-out of medicines.

## STRENGTHS

In this study, the first author has worked for more than three years as a procurement pharmacist and was responsible for the collection and analysis of data; therefore, to minimize bias, the collected data was cross-checked with the research participants during the interview process. This was done through member checking by frequently paraphrasing what participants said. An independent coder who is competent in qualitative research was also used to verify the findings and consensus was reached on the identified themes.

## LIMITATIONS

The findings of this study reflect the pharmacists' perceptions from only one tertiary hospital in South Africa and therefore cannot be generalized to other settings. This study only interviewed pharmacists responsible for the procurement of essential medicines and did not include SCM officers. The perspectives of procurement officers from SCM responsible for the procurement of quotation items would have provided an in-depth perspective about quotation items.

## RECOMMENDATIONS

To improve the availability of essential medicines within the hospital, pharmacists and SCM officers should receive continuous training on procurement processes. Ensuring a reliable supply of essential medicines requires teamwork and communication among the stakeholders. This study therefore recommends that a formal communication forum to address challenges encountered in the provision of essential medicines be established and sustained. These may include regular multidisciplinary pharmaceutical supply management meetings, circulars, and memos to ensure that information about essential medicines availability reaches all stakeholders. Further studies are therefore recommended to include a larger group which



includes other stakeholders like procurement officers and use mixed methods to determine the types of essential medicines that are frequently out of stock and to explore the impacts of stock-outs.

#### LIST OF ABBREVIATIONS

ARV: Anti-retroviral  
DDV: Direct Delivery Voucher  
PPD: Provincial Pharmaceutical Depot  
PHC: Primary Health Care  
SCM: Supply Chain Management  
TB: Tuberculosis

#### AUTHOR'S CONTRIBUTIONS

Chuene TA: Project administration; Conceptualization; Methodology; Formal analysis; Writing - original draft.  
Matlala SF: Supervision; Conceptualization; Methodology; Validation; Writing- review & editing

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#### DECLARATION OF COMPETING INTEREST

The authors have no competing interest to declare.

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