



Financial Literacy, Economics Factors and Investing Decisions: A Study of Individual Investors in Iran

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ARTICLE INFO	ABSTRACT
Received: 18 March 2023 Reviewed: 12 April 2023 Revised: 1 May 2023 Accept: 29 May 2023	Purpose: This paper aims to investigate medicines' supply and demand challenges at Princess Marina Hospital in light of the prevalent shortage and unavailability of medicines in both the public and private sectors globally. Despite this, medicines remain essential commodities to healthcare systems. For Botswana, the unavailability of medicines situation has worsened over the past years due to complications from HIV, and AIDS. There was a need to investigate the supply and demand challenges of medicines at Princess Marina Hospital, Botswana's largest hospital. Methodology: A quantitative methodology using a close-ended questionnaire was used to collect data from a sample of 41 pharmacy personnel at Princess Marina Hospital. Data were analyzed using Microsoft Excel. Findings: The supply and demand challenges identified are low manufacturing capacity by manufacturers, shortage of raw materials, poor supply chain management by local suppliers, Botswana's uneconomical small market, inefficient logistic supply system, irrational use of medicines, Just-In-Time- Inventory, tendering system of awarding the lowest bidder, unexpected increased marketing strategies, long regulatory timelines, limited registered medicines, inadequate supply chain management skills, insufficient personnel, and poor collaboration between Princess Marina Hospital and Central Medical Stores. Originality/Value: This paper identifies the supply and demand challenges of medicines specifically in Princess Marina Hospital. To attain the purposes of the study, an inquiry was created containing two components related to investment decisions, including financial literacy and economic factors. The inquiry was delivered to a sample of 85 people. Descriptive data were used to expound on study samples in the way that frequency, mean, and standard deviation. In addition, of highest quality-sample t-test and a natural linear regression reasoning were used to test the study theory at a consequence level of 0.05. The main findings of this study include (I) the impact of financial knowledge and literacy on investment decisions and (II) the impact of economic factors on investment decisions. The focus was on investment and savings-related decisions and preferences. Banks, financial institutions, and investors can benefit from understanding the impact of financial literacy, behavioral, and individual factors, thus inviting investors to other financial options. The study provided many recommendations, the most important of which, is by communicating financial factors and knowledge of finance to financial literacy, allowing decision-makers to anticipate economic events and plan for the future.
Keywords: Supply and demand challenges, Shortage of medicines, Unavailability of medicines, Princess Marina Hospital	

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1. Introduction

The World Health Organization characterizes access to essential medicines as a need for all citizens. In recent years, the supply and demand challenges of medicines are causing shortage of medicines globally, and the governments worldwide are struggling to ensure access to treatment of their populations [1]. Inadequate supply of essential medicines is also hindering the United Nation's aim of achieving Universal Health Coverage (UHC) in the Sub-Saharan region [2]. In Botswana, all public sector health facilities are supplied by the Central Medical Stores (CMS), a government institution mandated to supply medicines and other health commodities [3]. The medicines supply system has suffered over the years due to poor resource management such as procuring incorrect medicines, provision of incorrect alternatives and supplying nearly expired medicines to the facilities, poor communication and collaboration between the CMS and the facilities [4].

Supply and demand challenges of medicines, except for oncology medicines, at Princess Marina Hospital (PMH) are not well documented as they have not been adequately researched on as per the databases that were reviewed. Therefore, this study is very important and urgent as there is a need to achieve Sustainable Development Goal 3.8 including UHC which covers access to safe, effective, quality, and affordable essential medicines and vaccines for all [5].

This study aligns with the recommendation by the International Pharmaceutical Federation which is advocating for country-specific investigations to assess various aspects of medicines shortages in-order to effectively curb them [6]. The outcome of this study is significantly adding to the body of knowledge and provide a wider overview on the magnitude of the supply and demand issues informed by research. These findings are an eye opener to the academics as this study identified an area that needs to be further investigated regarding the provision of medicines in the country. Additionally, this study is valuable as it is a reference point both to policy makers and academics on the supply and demand challenges of medicines and the level of research done so far in Botswana.

2. Methods

Quantitative methodology using a closed-ended questionnaire was employed in this study. The target population was 68 Pharmacy personnel involved in the management of medicines at PMH. A sample size of 41 was selected and these included Pharmacy Technicians, Pharmacists, Healthcare Assistants, Pharmacist Interns, and Pharmacy Students. Data were populated into Microsoft Excel, analyzed and presented in tables. The supply and demand challenges were categorized into supply, demand, regulatory, and institutional issues. Ethics approvals for this study were granted by the Botswana Health Research and Development Committee (Ethics clearance number: HPDME 6/13/1) and PMH Ethics Committee (Protocol Reference number: PMH 2/2A(7)/195). Written informed consent was obtained from participants.

3. Results and Discussions

3.1 Distribution of participants by profession

The composition of participants in terms of their pharmaceutical professions is shown in Figure 1 below.

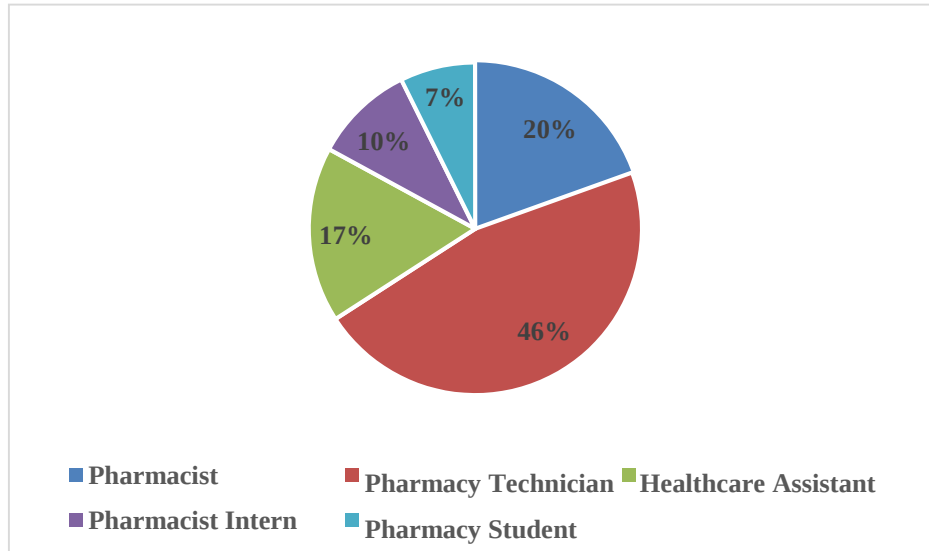


Figure 1. Distribution of respondents by profession at PMH

The study participants consisted of Pharmacy Technicians, Pharmacists, Healthcare Assistants, Pharmacist Interns and Pharmacy Students.

The findings in Figure 1 demonstrate that the pharmacy support workforce is mainly comprised of Pharmacy Technicians with Pharmacists providing a supervisory role [7]. Upskilled Pharmacy Technicians are reported to undertake Pharmacist roles, and this reduces patient waiting times, reduces hospital costs and increases patient satisfaction [8]. PMH has Pharmacy Technicians as the majority, and this means that PMH is saving on valuable resources that can be used to address the supply and demand challenges of medicines.

3.2. Supply challenges of medicines

There are several challenges associated with supply chains, and these are tabulated below.

Table 1. The supply challenges of medicines at PMH.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Challenges in medical supply					
Low manufacturing capacity decreases supply?	25 (61%)	11 (27%)	2 (5%)	0 (0%)	3 (7%)
Shortage of raw materials decreases supply?	25 (61%)	11 (27%)	1 (2%)	0 (0%)	4 (10%)
Uneconomical small market decreases supply?	23 (56%)	9 (5%)	2 (5%)	4 (10%)	3 (7%)
Inefficient logistic system decreases supply?	17 (41%)	11 (27%)	8 (20%)	2 (5%)	3 (7%)
Poor supply chain management by local suppliers decreases supply?	18 (44%)	15 (37%)	3 (7%)	3 (7%)	2 (5%)

Table 1 above shows that the main supply challenges of medicines were significantly and equally contributed by low manufacturing capacity and shortage of raw materials. The uneconomical small

market also highly contributed to the supply challenges of medicines than the inefficient logistic system, and poor supply chain management by suppliers.

The findings in Table 1 demonstrate that supply of medicines at PMH is decreased by low manufacturing capacity, shortage of raw materials, uneconomical small market, inefficient logistic system and poor supply chain management by local suppliers.

Supply of medicines is dependent on the manufacturing capacity. The finding is supported by the literature that reports that supply issues occur when manufacturers are unable to produce enough medicines to satisfy the demand [9-10]. Low manufacturing capacity was reported as a challenge prevalent in low and middle-income countries mainly due to inadequate finances [11-12]. PMH relies on old generic medicines for the patients, therefore, low manufacturing capacity of products by manufacturers lead to low supply at PMH.

Shortage of raw materials decreases supply of medicines. The finding is supported by reports in literature where shortage of raw materials occurred worldwide leading to the global shortage of medicines [13]. The shortage of raw materials cannot be addressed by PMH alone as it is mainly caused by global supply chains.

Uneconomical small market, such as of Botswana, decreases supply of medicines into the country, and as a result PMH is not spared from shortage of the medicines that are required by patients. This finding means Botswana's small pharmaceutical market does not really attract pharmaceutical business, hence supply of medicines is low. Literature reported that economic factors such as small markets contribute to business decisions with regards to where to invest, consolidation and stoppage of medicine production [14].

Inefficient logistic system, such as transportation also decreases supply. This finding means that Botswana, as the importer of all its medicines, is negatively affected by inefficient logistic systems along the supply chain. The literature confirmed that logistic issues such as transport and maintenance of cold chain are challenges that affect supply of medicines [6,12].

Poor supply chain management by local suppliers decreases supply of medicines in Botswana. This finding means that poor supply chain management by local suppliers is one of the supply issues that contribute to shortage of medicines. The CMS is the main local supplier of medicines to PMH and poor medicine supply management inefficiencies at CMS have been reported which are in line with the study findings [4]. The CMS must address the inadequate skills and quantification system for the improvement of supply of medicines at the facilities including PMH. The findings are supported by the literature in which logistic issues such as medicine supply management inefficiencies are reported as the main causes of medicines shortages [12,15].

3.3. Demand challenges of medicines

The demand challenges of medicines are tabulated below.

Table 2. The demand challenges of medicines at PMH

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The demand challenges of medicines					
Tendering system of awarding the lowest bidder increases demand?	16 (39%)	12 (29%)	6 (15%)	4 (10%)	3 (7%)
Unexpected increased marketing strategies increases demand?	14 (34%)	11 (27%)	8 (20%)	4 (10%)	4 (10%)
Ordering quantities as per current need without any backup plan for future demand increases demand (Just-in-time inventory)?	16 (39%)	13 (32%)	5 (12%)	4 (10%)	3 (7%)
Irrational use of medicines increases demand	24 (59%)	8 (20%)	2 (5%)	4 (10%)	3 (7%)

Table 2 above shows that the main demand challenges of medicines were significantly contributed by the irrational use of medicines. Just-in-time inventory and tendering system of awarding the lowest bidder also contributed equally followed by unexpected increased marketing strategies.

The findings in Table 2 demonstrate that demand of medicines at PMH are increased by awarding tenders to the lowest bidders, unexpected increase in marketing strategies, ordering quantities as per current need without any backup plan for future demand, and irrational use of medicines.

Awarding tenders to the lowest bidders or awarding a single supplier carries a risk of not supplying, leading to unavailability and high demand of medicines. This finding is supported by literature where ineffective tendering practices lead to medicine shortages [16-17]. PMH is involved in micro-procurement tenders and the same principles of not awarding a single lowest bidder solely based on lowest price should be considered when tenders are awarded.

Unexpected and increase in marketing strategies intensifies the demand of medicines. This finding aligns with literature where marketing strategies such as unethical promotion strategies, outbreaks, natural disasters, and seasonal demand are reported to lead to increased demand [18]. The results mean that increased marketing is a demand issue, and increased marketing strategies do cause shortage of medicines.

Ordering quantities as per current need without any backup plan for future demand (Just-In-Time-Inventory) increases demand. These results mean that Just-In-Time-Inventory is a demand issue that affects availability of medicines. PMH is a referral hospital and new patients come every day requiring new medicines. This means that the needs for medicines change all the time, therefore, ordering quantities as per current need do not meet the need of the next day. The results confirm the literature that Just-In-Time-Inventory allows for unexpected shortages of medicines [19].

Irrational use of medicines also increases demand. This finding means misuse of medicines in PMH is a demand issue contributing to shortage of medicines. The results are in line with reports from literature in which irrational use of medicines is reported as a global problem [20]. Medicines are a scarce commodity hence misuse surely would result in their shortages and unavailability.

3.4. Regulatory challenges of medicines

The regulatory challenges of medicines are tabulated below.

Table 3. The regulatory challenges of medicines at PMH

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The regulatory challenges of medicines					
Limited registered medicines decrease supply?	22 (54%)	12 (29%)	4 (10%)	0 (0%)	3 (7%)
Long regulatory timelines decrease supply?	19 (46%)	16 (39%)	3 (7%)	1 (2%)	2 (5%)

Table 3 above shows that the main regulatory challenges of medicines were significantly contributed by limited registered medicines followed by long regulatory timelines.

The findings in Table 3 above demonstrate that regulatory challenges such as limited registered medicines and long regulatory timelines decrease supply. These results mean limited registered generic medicines lead to shortages of medicines. The results align with literature as generic medicines are reported affordable compared to the branded medicines and as a result limited registered generic medicines decrease supply [21]. This finding is also in line with assertion that regulatory requirements contribute to the shortage of medicines [22]. These results also mean long regulatory timelines are a supply issue that decreases supply hence PMH should engage the Botswana Medicines Regulatory Authority to come up with strategies that the timelines can be reduced. It has been reported in literature that long regulatory timelines cause delays in manufacturing and supply, leading to shortages of medicines [1,22].

3.5. Institutional challenges of medicines

The responses on the institutional challenges of medicines raised by participants are tabulated below.

Table 4. The institutional challenges of medicines at PMH

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The institutional challenges of medicines					
Poor Pharmacy Inventory Management system affects supply?	12 (29%)	7 (17%)	11 (27%)	7 (17%)	4 (10%)
Poor collaboration between PMH and the CMS affects supply?	12 (29%)	11 (27%)	10 (24%)	6 (15%)	2 (5%)
Insufficient Personnel affects supply challenges?	22 (54%)	9 (22%)	2 (5%)	3 (7%)	5 (12%)
Inadequate supply chain management skills affect supply?	15 (37%)	16 (39%)	6 (15%)	2 (5%)	2 (5%)

Table 4 above shows that the main institutional challenges of medicines were significantly contributed by insufficient personnel. Inadequate supply chain management skills also highly contributed to institutional challenges of medicines than the poor pharmacy inventory management system and poor collaboration between procurement PMH and CMS.

The findings of Table 4 demonstrate that institutional challenges such as poor collaboration between PMH and the CMS, insufficient personnel, and inadequate supply chain management skills decrease supply of medicines at PMH while poor pharmacy inventory management system was found not to affect the supply.

Poor Pharmacy inventory management system was found not to affect the supply of medicines at PMH. The findings mean the Pharmacy Inventory Management system at PMH is good, hence is not expected to cause any supply issues, or the system has no effect on supply of medicines. Since less than half of the participants supported the assertion that poor pharmacy inventory management system affects the supply, the assertion is not considered applicable to PMH. The results are contrary to literature where poor inventory management system can lead to forecasting irregularities [16,23].

Poor collaboration between PMH and the CMS affects supply. These results show that there is a need to improve collaboration between the CMS and the PMH. Literature reported poor collaboration between the CMS and the hospitals confirming the study results [6].

Insufficient personnel affect supply of medicines at PMH. The findings mean there is shortage of pharmacy personnel contributing to shortage of medicines at PMH. These results are supported by

literature as insufficient trained professionals are reported to contribute to shortages of medicines [24], hence study findings are confirmed.

Inadequate supply chain management skills affect supply of medicines at PMH. These results mean adequate supply chain management skills are necessary for supply chain management, therefore PMH should invest in training personnel in supply chain management as recommended in the literature [25]. The results are in line with literature where supply chain management skills are reported as one of the factors that cause shortages of medicines [6,16].

Although poor pharmacy inventory management system is not considered as an institutional challenge applicable to PMH, the results were borderline, which may imply that this challenge may materialize in the future, or it should be closely monitored.

4. Conclusion

This study identified the supply and demand challenges of medicines at PMH. All the four classes of supply and demand challenges of medicines have been identified: being supply, demand, regulatory, and institutional challenges. In total 14 out of 15 supply, demand, regulatory and institutional challenges that were identified from the literature review and included in the questionnaire have been confirmed to be applicable to PMH. The findings are highly significant and timely as they will bring PMH management to a deeper understanding of the supply and demand challenges of medicines at PMH, especially at the time PMH is still recovering from the effects of the COVID-19 pandemic. Furthermore, these findings will significantly add to the body of knowledge and provide a wider overview of the medicines in general in Botswana. PMH is a tertiary hospital, hence, further research should cover district hospitals, and CMS in Botswana to get a national perspective. Further research should also be performed in the private sector; this may include distributors and hospitals to see if challenges experienced in the private sector are common to the public sector.

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Conflicts of Interest

None.

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