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RESEARCH ARTICLE

STOCK MANAGEMENT IN PHARMACY: USE AND INTEREST OF THE DASHBOARD

Enneffah Wafaa, Berrada Ghita, El Harti Jaouad, Rahali Younes, Bennana Ahmed, Lamsaouri Jamal and El Wartiti Mohammed Adnane
Mohammed V University of Rabat, Faculty of Medicine and Pharmacy.

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Abstract

Background: The quality management system allows care structures to control the quality of care products and services by following carefully implemented indicators. In this wake, the dashboard and its indicators representa simple, fast and dynamic management tool. It makes it easier for its recipient to understand situations by presenting an overall idea of the managed system state. Our study aimed first to draw up an inventory concerning the use of the dashboard in pharmacies in a Moroccan city, and then to show its interest in the optimization of pharmacy stock management.

Resources and procedures: We conducted a survey of fifty pharmacy stores in the city of Fez (Morocco) regarding the use of dashboards. Given that the stock represents a major issue of economic, organizational and social performance in pharmacy, we were interested in our study in the stock management dashboard.

Results: 84% of surveyed pharmacies do not have a dashboard. In addition, all participants using a dashboard reported improvement of their stock management and expressed the need to further develop it and use it more often in the future.

Conclusion: The dashboard is an interesting tool for optimizing stocks in pharmacies. In addition, its use requires the training of pharmacists and their collaborators.

Introduction:

Stocks constitute operating values to be managed. However, their existence generates additional management costs. A stock management policy is considered efficient when it satisfies the customer at minimum cost. The decision-making process consisting in defining a stock management policy takes place in 3 stages: classification of the references to be managed, definition of the stock management model adapted to a reference or a group of references and configuration of the cost function in order to optimize the predefined management model. As a result, stock management remains a vast and complex concept, still poorly perceived by some pharmacists, and the implementation of a dashboard (DB) allowing stock management is essential. The objective of our survey is to demonstrate the importance of the implementation of the DB as an optimization tool of stock management through a situational analysis performed at the city of Fez – Morocco (Adande and Allossogbe, 2010).

Corresponding Author:- El Wartiti Mohammed Adnane
Address:- Mohammed V University of Rabat, Faculty of Medicine and Pharmacy.

Resources and procedures
Our survey was made in the city of Fez. It was spread over 6 months from August 2019 to February 2020 and included a total of 50 pharmacy stores. The population of pharmacists selected to participate to the survey includes those with a minimum of one year of experience, allowing the collection of the relevant data for the survey. The data was collected through an anonymous questionnaire distributed to head pharmacists in charge of the aforesaid pharmacies.

The questionnaire contains 36 open and closed-ended questions related to the following topics:
- Epidemiological characteristics (age, sex, family situation, etc.);
- Characteristics related to the pharmacy (staff, investment, etc.);
- Knowledge level of stock management;
- Knowledge level of the DB.
The collected data was reported and analyzed on Microsoft Excel 2007.

Results:-
The data analysis yielded the following results:

Characteristics of the studied population
The average age of our study population is 37.5 years with an interval varying between 25 and 50 years and a sex ratio M/F of 0.92.

Regarding the training place, 74% of the participating pharmacists have pursued their pharmaceutical studies in Morocco against 26% abroad.

The practice years vary from 2 to 25 years and 40% of pharmacists have an experience of 10 to 15 years.

Characteristics of the studied pharmacy stores
In our study, 62% of pharmacies are located in popular neighborhoods and 38% are located in middle-class and affluent neighborhoods.

Regarding the nature of acquisition, 86% of pharmacies are newly created and 14% were bought from former pharmacist owners.

The number of employees varies from 1 to 3 or more employees depending on the pharmacy.

Concerning the turnover (T/O), 66% of the pharmacies have a T/O $\geq$ to 1 Million MAD (Moroccan dirhams) and 34% have a T/O $\leq$ 500.000,00 MAD.

Stock management
Regarding the knowledge of traditional stock management methods (calendar-based method, replenishment at reorder point, replenishment method, replenishment as needed or tense flow method), the results of our study are represented in Figure 1 (Doriol and Sauvage, 2012; Julien, 2009).

For stock assessment methods, in particular stock inventory, it appears that 97% of pharmacists carry out a single annual inventory required by the regulations, and only 3% carry out an inventory 4 times a year.

Dashboard (DB)
In our study, 32% of pharmacists consider that DB only represents statistics, against 68% who consider it as indicators and ratios to be calculated.

Only 16% of our population uses a DB while 84% say they have never used it.

The cause analysis of the non-use of DB by the pharmacists in the survey shows the following results:
- Lack of perception of the usefulness of the DB (66.6% of the population);
- Lack of time (28.6% of the population);
- Ignorance of the methods for setting up the DB (4.8% of the population).

In pharmacies using a DB, the collection of the necessary data is done in 62.5% by the head pharmacist and in 37.5% in collaboration with the assistant pharmacist. Pharmacists using the DB use a "management dashboard". 60% of pharmacists update their DB monthly and 40% on a quarterly basis (Châari and Didier, 2008; Voyer, 1999). As for the analysis of the DB, the majority do it on an annual basis.

All of the pharmacists using the DB (16%) communicated to us only the indicators chosen for stock management (Table 1), with the exception of one of them (Pharmacy X) who also communicated to us the deviations and improvement actions taken to address them as shown on Tables 2 and 3 (Julien, 2009; Leroy and Lochard, 1998).

In our study, 87% of the participants using a DB had scheduled training sessions for their staff on the use of the DB. As for the means of raising awareness, 50% of the pharmacists raised awareness among their staff about indicators monitoring and analysis, half of whom used emoticons related to the results, while the other half have limited themselves to display the results of indicators on dedicated platforms.

Appreciation after using the DB

All participants noticed a clear improvement in stock management after using the DB and unanimously expressed their willingness to use it again to optimize stock management in their pharmaciesand think that its computerization facilitates its application.

Discussion:-

In this work, we drew up a report on the use of stock management DB in 50 pharmacy stores in the city of Fez. The obtained results show that the theoretical knowledge of stock management is growing over the years. Indeed, old pharmacists have developed more knowledge in this area compared to new ones which would positively impact their turnover and profitability. It is also noted that stock management get improved as the number of employees increases. This may be due to a better tasks distribution and the role of assistant pharmacists in optimizing pharmacy stock management.

Our study also showed that 58% of pharmacists are not familiar with all traditional stock management methods, making continuous trainings necessary (Julien, 2009). Furthermore, only 16% of pharmacists have implemented a DB. The latter is a "management dashboard" for all cases (Adande and Allossogbe, 2010; Fongang, 2015; LBM, 2013). In fact, no pharmacist has implemented a "balanced scorecard" (Kaplan and Norton, 2001, 2001). The low percentage of pharmacists who have implemented a DB shows that additional efforts are needed to expand the use of this tool, especially since pharmacists who have used it report better stock management (compared to those who have not used it) and express a willingness to use it again in the future. This confirms the importance of using this tool to optimize stock management in pharmacies.

Of the 84% of pharmacists not using a DB for stock management, 67% were unaware of its usefulness, which confirms the relevance of our survey. Nevertheless, they expressed their willingness to develop this tool in the future after being made aware of its importance and interest that it presents for pharmacy management.

Concerning the frequency of DB analysis, the majority of pharmacists do it only once a year, whereas a monthly analysis would allow better optimizing stock management.

It is noted that only one pharmacist allowed us to collect the indicators (Pharmacy X), the gaps, and the improvement actions taken to correct them. The rest of the pharmacists would consider this data confidential.

Although 87% of pharmacists using a DB organize training sessions for their staff on the use of the DB, only 50% make them aware of indicators monitoring and analysis, which requires additional efforts in terms of staff awareness and monitoring. In order to address the encountered problems, we asked our study population about the awareness methods used and we concluded that the best method is the one that combines two awareness methods, namely the flashing lights method, which visually attracts attention, and the meetings method, which is essential for the proper monitoring of indicators.

The comparison between our survey and that carried out by Bouzoubaa, F. shows that the latter introduces concepts that we did not explore in our survey (Bouzoubaa, 2015). This is the case of the stock in depth, the stock in width and the prestige stock. Nevertheless, both works underline the importance of the use of the computer tool in the

elaboration of the stock management DB and the interest of the continuous training of head and assistant pharmacists in the use of this tool.

The analysis of the results of our study and those obtained by Goujeau, B. de La Valle shows that the use of the stock management DB by pharmacies in La Valle is more developed than in Fez, and that most of these dashboards are computerized and monthly analyzed (Goujeau, 2017). It also appears that the pharmacies in La Valle are increasingly interested in the management of dead stock, whereas in Fez most of the dashboards are not computerized and their analysis remains annual in most cases. In addition to that, used indicators are customized and differ from one pharmacy to another.

Similarly, the work carried out in Liège by Doriol, D. and Sauvage, T. emphasizes that the majority of pharmacies use computerized software for stock management, unlike our context where computerized tools are hardly used (Doriol and Sauvage, 2012). The comparison between our study and that carried out in Liège also shows that in Liège the focus is on indicators of turnover and stock-outs, whereas in Fez these indicators are also used, but in addition to other indicators that differ from one pharmacy to another.

Table 1:- Indicators used by pharmacies using DB.

Indicators	**Percentage of population using DB**
Stock coverage rate	62,5%
Stock carrying cost	12,5%
Stock holding rate	25%
Stock-out rate	12,5%
Economic quantity	37,5%
Number of stock-outs per month	75%
Safety stock of each product	50%
Percentage of available products	25%
Average time of out-of-stock	25%
Depreciation rate	50%
Turnover rate	100%
Delivery time to customers	25%
On-time delivery	50%
Average monthly consumption	12,5%
Working capital stock	25%
Average stock	25%
Number of orders/supplier/year	12,5%
Committed budget/planned annual budget	12,5%

Table 2:- Identified gaps after analysis of the various indicators at Pharmacy X.

Indicators	**Responsible**	**Periodicity**	**Expected results**	**Gaps**	**Emoticons**
Number of management meetings	Pharmacist	Once a month	12	-2	
Number of dashboards	Pharmacist	Annually	1	0	
Inventory coverage rate	Pharmacist	Everyday	100%	-15%	
Service rate	Pharmacist	Every month	95%	-10%	
Cost of stock ownership	Pharmacist	Every month	10.000 MAD	-1.000 MAD	
Economic quantity of each product (e.g. Paracetamol 1000 mg)	Pharmacist	Every month	40	0	

Number of stock-outs per month	Pharmacist	Every month	0	+2	😐
Safety stock of each product	Pharmacist	Every month	2	-1	😐
Percentage of available products	Pharmacist	Everyday	100%	-5%	😐
Stock out average time	Pharmacist	Every month	A week	+3 days	😐
Depreciation rate	Pharmacist	Every month	0	0	👍
Rotation rate	Pharmacist	Every month	30.000 MAD	0	👍

Table 3:- Improvement actions deployed in Pharmacy X.

Problems	**Improvement Actions**
Number of management meetings lower than the one set per year	- Dedicate more time to meetings to ensure optimal staff awareness; - Schedule meeting reminders to keep the meeting on schedule.
Lower service rate	Raise the awareness of suppliers regarding the impact and damage resulting from late delivery.
High cost of stock ownership	Minimizeexpenses (telephone, logistics, etc.).
Increased number of stock-outs per month	Recalculate and plan a safety stock according to sales rate.
-Safety stock of each product below the threshold -Increased stock out average time	- Increase the stock and set a safety stock to cover customers needs and demands; - Calculate the economic quantity.
-Stock coverage rate below standard -Percentage of available products below threshold value	- Calculate orders optimum number; - Reinforce the rounds on the shelves to detect missing products.

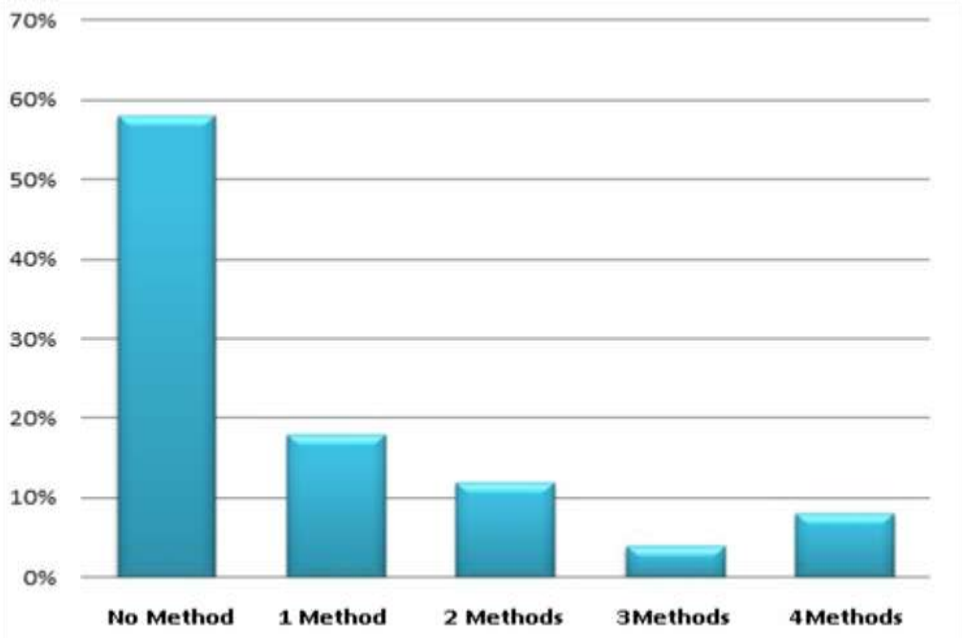

Figure 1:- Use of traditional stock management methods in studied pharmacies (n=50).

Conclusion:-

The implementation of a management tool requires a good knowledge of the pharmacy's activities, its organization and its strategy. In the light of the obtained results, it is necessary that head pharmacists, especially the younger ones, take more interest in the process of elaborating dashboards as well as in training and raising the awareness of their collaborators regarding the active use of this tool, which would allow them to successfully implement their strategic visions in the field. Indeed, these dashboards are an excellent example of management control, since they ensure a reliable diagnosis of the pharmacy's situation and the implementation of action plans for each indicator whose result is not satisfactory, which ultimately allows to reduce gaps and to take the managerial decisions that are necessary for the good management of these pharmaceutical companies.

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