Internal control and supply of medicines in the pharmacy area of the Zarate Health Centre - 2021 [version 1; peer review: awaiting peer review]

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Abstract

Background: The purpose of this research was to evaluate whether internal control helps the supply of medicines in the pharmacy area of the Zarate health center in 2021.

Methods: The research method was deductive and descriptive-observational. The approach was quantitative, as the analysis was observational based on documentary analysis. It was an applied, non-experimental, cross-sectional design. The population and sample were the documentation of internal control and medicine supply in the pharmacy area of the Zarate health center in 2021. Due to the nature of the research, a checklist was used as a data collection instrument, which was used to collect all the information from the documentation available at the study site.

Results: As main results, it was found that the evaluation of internal control obtained a score of 63 out of 66 possible points, with 95.5% compliance, and the supply variable obtained a score of 37 out of 42 possible points, with 88.1% compliance.

Conclusion: It was found that internal control affects and helps the supply of medicines in the pharmacy area of the Zarate health center in 2021.

Keywords
Internal control, supply, medicines, pharmacy, health center, logistic, control.
Introduction

Health is one of the fundamental rights to which people must have access, but when talking about health, it is essential to talk about medicines, since it is well known that every patient who comes for medical attention receives his or her respective prescription. However, patients do not always find the medicines they need; on the contrary, sometimes the products they require are out of stock, making patients must buy them in a private pharmacy, since the periods of shortage can last for months. This problem is faced by several health centers, such as the Zarate Health Center, where there are problems due to the lack of medicines needed by patients.

According to Videnza Consultores, supply involves the strategic management of resources to meet patients’ needs and thus satisfy healthcare demand.

Srivastava et al. indicates that in health centers the lack of drugs is a critical issue, since the patient’s life is at stake and this can go from a normal to a critical condition if the necessary medication is not available and the costs become great, not only in monetary terms, but also in the risk of the loss of the patient’s life.

Bernal et al. comment that, in recent years, medicine shortages and supply problems have recurrently increased globally, affecting availability and with serious consequences for patients, health systems and society.

According to what was obtained by the National Institute of Statistics and Informatics - INEI in its report “The Technical Report on Living Conditions in Peru” in the April-May-June 2021 quarter, 79.7% of the population reported that they have some type of health insurance. Of the total population, 52.5% indicated that they use the Comprehensive Health Insurance (SIS), 22.9% use the Social Health Insurance (EsSalud), and 4.3% have another type of insurance. As reported as of July 31, 2019, 30.1% of care facilities at the local level had low availability of essential medicines, 30.5% had regular availability, 29.5% had high availability, and only 9.9% had the optimal amount, according to the latest information reported by the General Directorate of Medicines, Inputs and Drugs-Digemid through the portal of the Foreign Trade Society of Peru-ComexPeru in turn by source of the integrated system of supply of medicines and medical-surgical supplies.

ComexPerú also indicates that the problem of shortages shows that some activities need to be strengthened, such as corporate purchasing and drug stock monitoring systems. In 2018, the Ministry of Health facilities that used corporate purchases, a total of 22.4% of medicines purchased were out of stock, as well as 21.4% presented an overstock, all this generates various challenges to improve the management of health systems. The Hospital web portal points out that inadequate practices in the administration of medicines lead to cost overruns and reprocessing with direct repercussions on patients’ clinical outcomes and on the sector’s finances.

Also, the web portal Gestion in its economy section indicates that the shortage of medicines in health centers, health posts and hospitals, together with the number of patients suffering from diseases at home and who do not receive medicines from the State due to availability, generates an increase in demand in private pharmacies. Seinfeld points out that the lack of medicines in their health centers leads patients to seek medicines in private pharmacies or pharmacies, thus incurring high costs. According to the World Bank, the expenditure is around 30%, although the maximum expenditure recommended by the World Health Organization is 20%.

The Consumers and Users Organization-OCU in its analysis showed that in 7 European countries 65% of the total cases of stock-outs are not reported as to their causes. The same situation occurs in specific cases of drugs of great clinical impact such as essential drugs or oncological therapies. The lack of drug supply is a problem of a global nature. It is complex and multifactorial, there are several causes that explain the lack of certain drugs, and there are not only several, such as: problems in the production process, voluntary withdrawal of the drug, problems in estimating demand.

The work is justified with the intention of continuing to contribute to the existing knowledge, because the results help to increase the already existing theoretical knowledge of the relationship between the variables: internal control and sourcing. Regarding the methodological contribution, it was focused on the collection of information and documentary review of internal control and supply, which allowed reviewing and validating all the documentation referred to these two variables, focused on the review and evaluation of processes and procedures that are used for the internal control of medicines and also how are the processes and procedures for the supply of drugs within the study site. And finally, it was carried out with a practical justification, because the pharmacy area presented problems of shortage of medicines which causes that the health problems of patients cannot be attended, therefore through the application of internal control the activities, plans, processes, policies, records, procedures that are performed in the environment to prevent risks that affect a public entity were evaluated, therefore the results obtained will be for the benefit of the health center.
Finally, considering the problem and its social relevance, it is of great importance to evaluate the internal control and its influence on the supply chain in the pharmacy area of the Zarate Health Center this year.

**Methods**

The research methodology is deductive and descriptive-observational. The approach was quantitative because the analysis was observational based on a documentary analysis. At the same time, it was applied and of non-experimental and cross-sectional design. Ethical approval was not required for this section because no humans and/or animals were used in this research.

Because the research is applied-descriptive, the population is made up of documentation on the supply of medicines from the pharmacy area of the Zarate health center. Information was collected on distribution guides, storage, incoming and outgoing movements of medicines, batch and/or expiration date, dispatch, and outgoing transfers of medicines between health facilities, Kardex, MOF and ROF.

The internal control and drug supply documentation of the pharmacy area of the Zarate health center was used as a sample. Due to the nature of the research, sampling is not applicable. It should be noted that all available documentation from the study site was used for the study of both variables.

For data collection, the documentary analysis technique was used and a checklist was used as an instrument to evaluate internal control in the supply of medicines in the pharmacy area of the Zarate Health Center.

For the evaluation of the internal control variable, an internal control checklist was used to identify whether internal control is carried out in the pharmacy area

a) Control environment

b) Risk assessment

c) Control activities

d) Information and communication

e) Supervision and monitoring

Scores: Obtained through manual ratings.

Grades: 1 to 2 per item.

For the evaluation of the supply variable, an internal control checklist was used to identify whether supply management in the pharmacy area is adequate.

a) Request

b) Reception

c) Storage

d) Dispatch/Expediting

- Scores: Obtained through manual ratings.

- Scores: 1 to 3 per item.

For the validation of the instrument, expert judgment was used, so that three experts in the field were selected to submit the questionnaire for validation.
The method used to estimate the reliability of the instrument was the Cronbach’s Alpha Coefficient test, whose alpha value must be between 0.7 and 0.9, which allows the reliability of the questionnaire to be measured. A reliability of 0.785 was obtained according to the Cronbach’s Alpha Coefficient test.

An analysis was carried out based on the review of documents and observation, and then the data was entered into the SPSS version 21 program and processed by variables and dimensions. Finally, the values obtained were compared with the antecedents found and with the theoretical framework presented.

The writing was done using the Word office program.

For hypothesis testing, since this was an applied-descriptive study and there was no hypothesis test, we worked with frequency tables and figures of the data obtained from the data processing that was carried out (SPSS 21 and Excel)

**Results**

**Figure 1** shows the evaluation of internal control, with a score of 63 out of 66 points for the dimensions of control environment, risk assessment, control activities, information and communication, supervision, and monitoring. In the total analysis of the variable, the dimension with the lowest score was risk assessment.

**Figure 2** shows the evaluation of the control environment, with a score of 18 out of 18 points. It was found that the pharmacy area has an institutional operating plan, a record of goals, vision, mission, and values, as well as a manual of good storage and dispensing practices for logistics operations, and the SOP describes the functions in writing, and the personnel are trained by the technical director monthly.

**Figure 3** shows the evaluation of the risk assessment, with a score of 11 out of 14, where it is important to note that the critical factors in the pharmacy area whose negative changes have not been determined, they do not know if complaints have been received in the area, and they do not have a risk management matrix.

**Figure 4** shows the evaluation of information and communication, with a score of 10 out of 10. It was found that there are information systems that have been implemented in the area, there are lines of communication for coordination and feedback on goals, objectives and work programs, and it is clear to whom the results should be communicated.

**Figure 5** shows the evaluation of supply, in which a score of 37 out of 42 possible points was obtained according to the checklist, where the dimensions of requirement, reception, storage and dispensing were analyzed, where the lowest score was obtained in reception, because only sometimes a control of the reception of medicines and supplies is performed.

![Figure 1. Internal control variable.](image-url)
Figure 6 shows the evaluation of the requirements, where a score of 12 out of 12 was obtained. It was found that there is a schedule of the requirements needed for monthly care, and there is a schedule for the acquisition of medicines, where there is also a system for entering requirements.

Figure 7 shows the evaluation of the reception area, where a score of 7 out of 9 was obtained. Controls are only sometimes performed at reception, and the personnel only sometimes, depending on who is in charge, verify characteristics such as quantity, quality and good condition.

Discussion and conclusion
The general objective was to evaluate whether internal control helps the supply of medicines in the pharmacy area of the Zarate-2021 health center. One of the limitations that was feared was the confidentiality of the data, since the study was
carried out in a public institution, but the pertinent permissions were requested from the heads of the competent areas and all the documentation necessary for the study was freely accessible. According to the findings of the present study, it was found that the internal control variable obtained a score of 63 out of 66 points in its evaluation (95.5% compliance) and the supply variable obtained a score of 37 out of 42 (88.1% compliance). Thus, internal control helps the supply of medicines in the pharmacy area of the study center. The study is similar to that found by Espinoza,¹¹ whose study concluded with an affirmation of the hypothesis that there is a correlation between internal control and the supply system and that the first variable is significantly influential with the second variable and vice versa. Although the work done is not correlational, it can be inferred that there is an association due to the fact that having a good internal control will help in a positive way to the supply of medicines within the pharmacy and not only in this, according to the research carried out in a descriptive and

![Figure 4. Information and communication dimension.](image)

![Figure 5. Supply variable.](image)
observational way, it was found that there is a high score in the internal control having documented information regarding goals. The dimensions of control environment, risk assessment, control activities, information and communication, supervision and monitoring show that there are adequate controls to keep the pharmacy area in good working order, which is reflected in a high score in the supply system, since there is a good management in the processes of requirement, reception, storage and dispensing. The results are valid not only internally in the study site, but also externally, due to the large conglomerate of pharmacies of the state institutions, the study can be used as a precedent to investigate whether the
internal control of the supply of medicines in the health centers is being carried out in an optimal and efficient manner. In relation to the general objective, it is evident that internal control affects and helps the supply of medicines in the pharmacy area of the Zarate 2021 health center. According to the instruments applied, the internal control variable scored 63 points with 95.5% compliance and 37 points with 88.1% compliance.

**Data availability**
Zenodo. Internal control and supply of medicines in the pharmacy area of the Zarate Health Centre 2021. DOI: https://doi.org/10.5281/zenodo.6388170

This Project contains the following underlying data:
- Study results.xlsx

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

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