

Evaluation of a teaching manual for the dispensing of over-the-counter medicines

Evaluación de un manual didáctico para dispensación de medicamentos de venta libre

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ABSTRACT

The study evaluated a didactic manual for the dispensing of over-the-counter medicines, focused on improving the competencies of pharmacy personnel without professional training. The starting point was the problem of inappropriate medicine use, associated with self-medication, absence of guidance during dispensing and lack of staff training. The objective was to design and evaluate a didactic manual to improve knowledge and dispensing practices for over-the-counter medicines in community pharmacies. The methodology included the participation of 20 pharmacies and was developed in three phases: an initial survey to measure knowledge, the implementation of a manual with didactic strategies and a final evaluation after one month of application. Data were analyzed using descriptive statistics. After the application of the tool, significant improvements were observed in knowledge, understanding of dispensing and delivery of indications, especially non-pharmacological recommendations. However, limitations persisted in the communication of adverse effects due to the lack of pharmacology knowledge. The didactic manual is a useful tool for improving dispensing, but its effectiveness depends on strengthening pharmacology knowledge. The importance of continuous training for pharmacy staff to ensure the safe and appropriate use of medicines is also highlighted.

Keywords: manual, OTC, over-the-counter, dispensing, community pharmacy

RESUMEN

El estudio evaluó un manual didáctico para la dispensación de medicamentos de venta libre, enfocado en mejorar las competencias del personal de farmacia sin formación profesional. Se partió del problema del uso inadecuado de medicamentos, asociado a la automedicación, ausencia de indicaciones en la dispensación y falta de capacitación del personal. El objetivo fue diseñar y evaluar un manual didáctico que permita mejorar el conocimiento y las prácticas de dispensación de medicamentos de venta libre en farmacias comunitarias. La metodología incluyó la participación de 20 farmacias y se desarrolló en tres fases: una encuesta inicial para medir conocimientos, la implementación de un manual con estrategias didácticas y una evaluación final después de un mes de aplicación. El análisis de los datos se realizó mediante estadística descriptiva. En los resultados posteriores a la aplicación de la herramienta, se observaron mejoras significativas en el conocimiento, la comprensión de la dispensación y la entrega de indicaciones, especialmente en recomendaciones no farmacológicas. Sin embargo, persistieron limitaciones en la comunicación de efectos adversos debido a la falta de conocimientos en farmacología. Se señala que el manual didáctico es una herramienta útil para mejorar la dispensación, pero su efectividad depende del fortalecimiento de conocimientos en farmacología. También se resalta la importancia de la formación continua del personal de farmacia para garantizar un uso seguro y adecuado de los medicamentos.

Palabras clave: manual, OTC, venta libre, dispensación, farmacia comunitaria

INTRODUCTION

Unlike other consumer products, medicines are directly related to health (Aguzzi and Virga, 2009); however, the population does not always understand that they are substances foreign to the body, that they involve risks and that they should be used with the guidance of a trained professional (Heineck et al., 1998). On the other hand, access to medicines is an indicator of a country's standard of living, since it reflects the efficiency and strength of a health system. In Ecuador, although

the process of medicine supply has improved, there is no systematic control of dispensing, which affects their appropriate use (Ortiz et al., 2014). This leads to an increase in irresponsible medicine consumption, the addition or removal of drugs in pharmacological treatment, or the erroneous consumption of drugs. In addition, problems of self-medication or misuse of pharmacological treatments occur because patients obtain their medication from non-medical sources, such as recommendations from neighbors, relatives, or pharmacy personnel who are not trained. In Ecuador, formal pharmacy studies are not mandatory to work in a pharmaceutical establishment, a situation that has been associated with the inappropriate use of medicines. These antecedents make it possible to identify where attention should be prioritized to mitigate the problem, since continuous training of professionals and pharmacy personnel is important for better health management (Luiza et al., 2019).

Among the most frequent reasons for self-medication are pain, particularly headache, flu and nasal congestion, abdominal pain and muscle pain. According to previous studies, in 1 out of every 3 cases, no prescription is required to sell a medicine; therefore, medicine consumption goes beyond over-the-counter products (Martínez et al., 2013). Solano et al. (2017), in their study on over-the-counter medicines, mention that the National Poison Control Center reports paracetamol as the medicine that causes the highest number of intoxications in Costa Rica, followed by combined flu medicines.

Within the professional field and medicine management, the dispensing of medicines and health products is the basic professional activity of pharmacy personnel and concentrates the greatest number of actions in community service. It is oriented toward ensuring that patients receive and use their pharmacological treatments according to their clinical needs and at the appropriate time (Barreiro et al., 2021). Currently, changes are taking place in health disciplines, which have had an impact on competency training, including skills and techniques based on experience and clinical practice, especially in people related or close to the pharmaceutical field. According to the World Health Organization (WHO) and the International Pharmaceutical Federation (FIP), the role of the pharmacist is to participate in improving health through patient education and guidance for better

use of medicines and pharmaceutical products (Garcés, 2024). Therefore, the mission of pharmacy personnel is to support health improvement in general and help patients make the best use of medicines. Their objectives include identifying, managing or detecting health problems, ensuring the efficacy of medicines, preventing harm caused by medicines, and making responsible use of resources in pharmaceutical care (Baixauli et al., 2013); these activities require continuous training of professional competencies, maintaining updated skills and experiences (FIP/OMS, 2012), which allow the provision of professional care services.

Training is understood as a way of operationalizing the training skills of a company's human talent, through education related to areas that benefit job performance (Rojas and Paniagua, 2013). In the case of the pharmacy office, constant training and practice are required to meet institutional objectives. Although evidence suggests that acquiring knowledge about a topic does not guarantee better performance, performance is supported by the application of acquired knowledge, competencies and experiences. An updated professional practice strengthens quality of care and patient protection (Guerra, 2025).

Training in the health area is a strategy that generates tools to reduce the irrational use of medicines. Health education actions have been shown to be beneficial in school contexts and in communities related to health activities (Nagem et al., 2020). In general, courses and regulations related to health are taught by people who master the field but lack strategies to transmit knowledge efficiently, comprehensibly and constructively (Hidalgo et al., 2017). By contrast, more pleasant and engaging representations suggest better learning than traditional texts or regulations, since they are retained for longer periods and constitute a more accurate, memorable and pleasant medium (Negrete, 2002).

Fernández (2024) states that there are several antecedents that show a deficit in the training of pharmacy assistants, the presence of dispensing errors, non-compliance with good pharmacy practices and the lack of follow-up of steps in the dispensing process. In addition, knowledge about dispensing processes was poorly known by pharmacy staff.

The importance of manuals lies in the fact that they explain procedures in detail. Through the use

of this method, errors can be avoided, failures can be detected and new personnel can be guided when they enter the institution (Estrada, 2018).

This study presents a study and training tool on the correct way to dispense over-the-counter medicines in community pharmacies. This tool is aimed at personnel who do not have formal studies and seeks to identify the level of learning and improvements in dispensing activities through its use.

METODOLOGÍA

A quantitative study with a one-group pretest-posttest design was conducted, taking care of the methodological quality of the applied measures as recommended by Vera-Quinonez et al. (2025).

The user guide on good practices for receiving, storing and dispensing medicines in pharmacies and first-aid medicine cabinets, issued by ARCSA in 2015, and the pharmaceutical care manual for pharmacies in the comprehensive public health network, complementary private network and private pharmacies, delivered by the Ministry of Public Health in 2021, were used as references.

A total of 20 independent pharmacies in the city of Riobamba were considered. These pharmacies had a current operating permit and personnel with more than 1 year of experience as pharmacy assistants, who did not have third-level studies related to the pharmaceutical area. The selection of the 20 pharmacies was non-probabilistic and based on acceptance of participation in the research; therefore, the sample is not representative of the population.

The creation of an exclusive didactic manual was proposed to present the correct dispensing of over-the-counter medicines, aimed at pharmacy personnel in a didactic manner, emphasizing key points and the types of patients who may be attended.

A data collection tool was developed and used before and after the application of the manual in the pharmacies. It consisted of 3 parts: the first was an open-ended question on the definition of dispensing. For the analysis, keywords such as 'delivery of information', 'prescription validation', 'informing' and 'providing pharmaceutical care' were established, and responses containing these elements were considered correct. In addition, a second question was included about knowledge of

the pharmaceutical care manual, with an affirmative or negative response.

In the second part of the tool, 3 questions were included about the dispensing of medicines for a mild condition that could be treated without a prescription. The first question sought to determine whether indications on the correct use of medicines were provided, such as dose, frequency and treatment duration; the second, whether possible effects of the medicines or warnings were indicated; and the last, whether non-pharmacological recommendations aimed at improving general health were provided. Each question corresponded to 1 point, and a maximum score of 3 was considered a complete dispensing process.

For the last part of the form, participants were asked to identify banal symptoms from a list of 10 options. For tabulation, 1 point was assigned for each correct answer: chest pain 'no', headache 'yes', muscle pain 'yes', high fever 'no', abdominal stabbing pain 'no', stomach discomfort 'yes', cough 'yes', nasal congestion 'yes', respiratory allergy 'no' and swelling of the extremities 'no', for a total of 10 points.

Different study techniques were combined for the preparation of the manual. Initially, theory was presented through readings about pharmacy and first-aid medicine cabinet regulations, as well as excerpts from the dispensing manual where over-the-counter medicine dispensing is mentioned. This type of training helps transmit a unified message.

The second part corresponded to programmed instruction. The researchers interpreted the readings together with the beneficiaries, practical examples were used, doubts were resolved and the topics were explored in greater depth.

The third part involved exercises, corresponding to training with simulators; that is, the workplace or a specific experience was simulated in order to put the manual into practice.

Throughout the manual, simple, practical and graphic language was used for faster identification of the topic. In the end, a 20 page document was prepared with theory and practical cases for the correct dispensing of over-the-counter medicines.

The document was given to each pharmacy assistant, and, through general training, each part was analyzed so that it could be applied in each pharmacy. After 1 month, the questionnaire was applied again to the participating personnel, and open-ended questions about the experience and

usefulness of the manual were added (see the instrument in the Appendix).

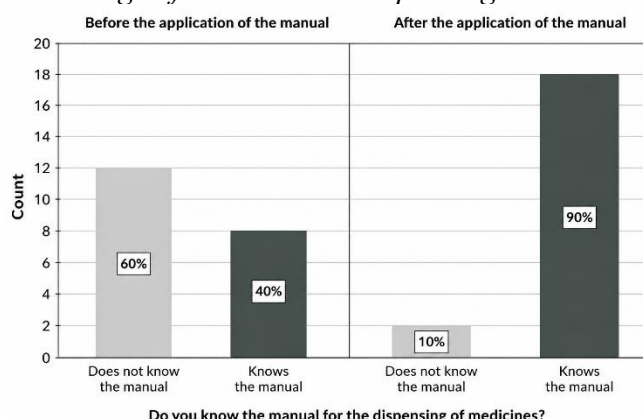
The results were tabulated according to the scores assigned to each part and analyzed using SPSS version 25. Inferential analysis was applied.

RESULTADOS

In the preliminary data collection before the application of the manual, it was observed that 60% of the participants stated that they did not know the national dispensing manual. Confusion was also identified between this document; the good practices guide and other regulatory pharmaceutical documents. For the question about the definition or what was understood by dispensing, the aforementioned keywords were used as reference; 70% of the people considered that pharmaceutical dispensing only meant selling or delivering the requested medicine, which was considered an incorrect answer.

Figure 1

Knowledge of the medicine dispensing manual



Source: Own authorship, figure created in SPSS 25

In the subsequent analysis of the same questions, it was observed that 90% identified the pharmaceutical care manual. The remaining group mentioned that they still did not recognize the document and showed a lack of interest in searching for it or in learning. The definition of dispensing was clearer: 80% of participants correctly defined dispensing in their own words. In the remaining percentage, doubts still existed, since they included the act of selling or quickly dispatching the customer. This response occurred because pharmacy assistants understood that their main function was to sell more products and promote the establishment.

For the second part of the tool, participants were asked to indicate how they would dispense medicines for a condition in which over-the-counter medicines could be supplied. In the initial survey, seasonal flu was used as an example and, in the subsequent survey, cough was used. This change in conditions was made in order to obtain more reliable responses. The question was evaluated by assigning one point to each response: one point was considered for the delivery of indications such as dose, frequency and treatment duration; another point for the delivery of possible effects of the medication or interactions; and another for the delivery of non-pharmacological recommendations, with a maximum score of 3.

The written responses showed that, for recommendations related to seasonal flu, only 50% of the participants provided indications about the correct use of medicines, 25% provided warnings about the drowsiness they could cause, and no one gave non-pharmacological recommendations as indicated in the dispensing manual. Meanwhile, the percentage data after the training sessions and delivery of the manual indicated that 75% of pharmacy assistants did take into account the dosage and indications on how to take the medicine correctly, considering that the condition presented was simple non-infectious productive cough. In addition, 75% presented positive responses regarding warnings that can be provided for misuse or storage of medicines, and 100% indicated non-pharmacological recommendations.

To determine whether there were differences between the indications provided by pharmacy assistants when dispensing over-the-counter medicines for a given condition, Student's t-test for dependent samples was applied. The results show that there were differences in the number of indications delivered to patients during dispensing, $t(19) = -9.658$, $p = 0.023$; 95% CI [-2.190; -1.410].

The fundamental part of the study was the identification of symptoms considered banal and suitable for dispensing without a medical prescription. The list of 10 symptoms included the most representative symptoms in pharmacy practice and those that could generate confusion when dispensing. Each correct identification corresponded to 1 point, with 10 as the total score.

The Kolmogorov-Smirnov analysis determined the absence of normality in the data, as well as in their differences. Subsequently, the Wilcoxon related-samples comparison test, with a

95% significance level, showed that there was an increase in the recognition of banal symptoms after the introduction of training sessions and the designed over-the-counter medicine dispensing manual.

By generating a graph of group relationships before and after the application of the tool and training sessions, the count of each of the symptoms considered was evidenced, which made it possible to observe differences in the results. Chest pain decreased from 6 affirmative responses to only 1; fever went from 14 to 6 responses; abdominal stabbing pain went from 16 responses considering it a banal symptom to 4 after the application of the manual; respiratory allergy decreased from 15 to 8; and swelling of the extremities went from 16 to 6 responses considering it a banal symptom.

Tabla 1

Análisis McNemar para la identificación de banalidad de cada síntoma

	Pre				Post				p value
	Min.	Max.	Mean	St. Dev.	Min.	Max.	Mean	St. Dev.	
Chest pain	0	1	0.30	0.47	0	1	0.05	0.22	0.125
Headache	1	1	1.00	0.00	1	1	1.00	0.00	N/A
Muscle pain	1	1	1.00	0.00	1	1	1.00	0.00	N/A
High fever	0	1	0.70	0.47	0	1	0.30	0.47	0.039*
Abdominal stabbing pain	0	1	0.80	0.41	0	1	0.20	0.41	0.000*
Stomach discomfort	0	1	0.90	0.31	1	1	1.00	0.00	0.500
Cough	1	1	1.00	0.00	1	1	1.00	0.00	N/A
Nasal congestion	1	1	1.00	0.00	1	1	1.00	0.00	N/A
Respiratory allergy	0	1	0.75	0.44	0	1	0.40	0.50	0.092
Swelling of extremities	0	1	0.80	0.41	0	1	0.30	0.47	0.002*
Sum	7	9	8.25	0.79	5	8	6.25	0.97	<.001*

Note. The p value for each symptom was calculated with the exact McNemar test, while the Sum was analyzed using the Wilcoxon signed-rank test. The * marks significant values. N/A indicates that McNemar could not be calculated because all values were

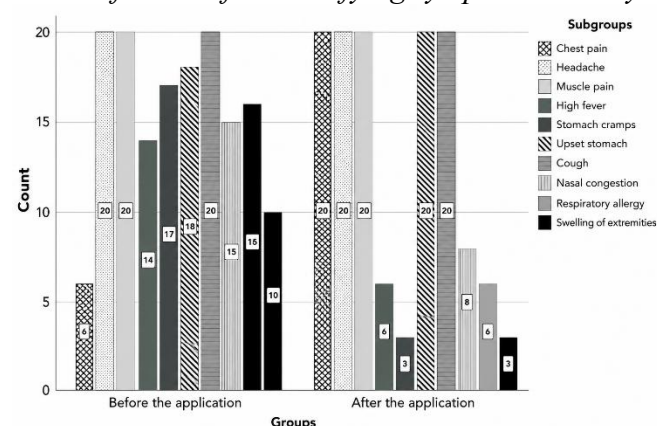
Source: Own authorship, calculations performed in SPSS 25

Because the tool was created to evaluate this specific case, it has not been validated in a unidimensional or multidimensional way, since the items themselves were of direct interest. Therefore, changes between the responses for each symptom before and after the application of the manual were statistically analyzed.

The analysis was performed using the McNemar test. For headache, muscle pain, cough and nasal congestion, it was not possible to

<https://doi.org/10.5281/zenodo.20739635>

Figure 2
Count of results for identifying symptom banality



Source: Own authorship, figure created in SPSS 25

calculate the p value, since all values were 1. The data are shown in Table 1 and indicate significant changes in high fever, abdominal stabbing pain and swelling of extremities. No significant changes were observed in chest pain, stomach discomfort and respiratory allergy.

DISCUSSION

The application of the manual, together with training sessions and didactic exercises, allowed participants to intervene actively, strengthening their knowledge of dispensing. According to Sáenz and Púas (2018), one characteristic of active methodologies is their capacity to promote skills in students that allow them to judge the complexity of the situation they must solve. Through learning modalities with simulations and applied practices, students are not spectators but become protagonists of clinical situations designed from everyday life, represented with a pedagogical intention, to learn from experience and from error as a source of learning (Calixto, 2025).

Indirectly, a lack of knowledge about the medicines to be dispensed was evidenced, showing that training in pharmacology does influence the level of care provided. This agrees with Castro and Molineros (2018), who indicate that the educational level of drugstore sellers decisively influences whether they recommend medicine uses to users.

The tool had a positive effect on the level of knowledge of pharmacy assistants. Although they are people without previous formal preparation, work experience allows them to understand the importance of dispensing and to put care protocols into practice in a better way. The application of dispensing activities facilitates the integration of knowledge, developing skills typical of the community pharmacist and allowing empowerment, since it helps develop confidence in their own capacities and actions (Martin, 2018). This is also related to Pérez (2022), who states that the services performed in community pharmacy should be communicated correctly, so that the population becomes aware that, in addition to dispensing the medicine, pharmacy personnel can help make it effective and safe, determining the valuable role of pharmacy staff.

One of the important changes identified was the delivery of non-pharmacological recommendations, in relation to what Gavilán (2017) states in his study: the lack of pharmaceutical care makes the customer live a less positive experience. Customer experiences are what pharmacy services seek to guide, highlighting the active role of those responsible for the service. In addition, customers value humane treatment and recognize

the need to incorporate tools that optimize care (Ríos and Villamagua, 2026).

The application of workshops within the manual, where participants could make decisions, identify patients, relate symptoms and follow protocol steps, gave prominence to the assistants. This methodology agrees with Calixto (2025), who indicates that simulated environments allow participants to experiment, make mistakes, correct them and try again, which strengthens autonomy and ethics.

At the end of the training process and after putting into practice what was indicated in the manual, not only better knowledge of dispensing was evidenced, but also an improvement in the quality of services delivered, in agreement with Miró's study (2002). In the training of personnel dedicated to pharmacy, elements such as professional attitudes and consultations must be taken into account, as well as decision-making skills, awareness and social responsibility.

The importance of constant training is highlighted, starting with the dispensing of over-the-counter medicines, a simple step but one of great importance for providing pharmaceutical care and building patient loyalty. The pharmaceutical field is constantly evolving, with new medicines, technologies and regulations emerging; therefore, it is crucial to remain updated through participation in continuing education courses (Ruiz, 2024).

CONCLUSIONS

The results show that the didactic manual, accompanied by training, contributed to improving knowledge about the dispensing of over-the-counter medicines and the delivery of indications to patients. The improvement was more visible in non-pharmacological recommendations and in the identification of symptoms that should not be managed solely through over-the-counter sales.

In a context in which formal training is not required for all pharmacy assistants, this type of tool is necessary to guide minimum dispensing practices and reduce errors associated with the inappropriate use of medicines. Nevertheless, its scope depends on continuous training processes and workplace follow-up. The main limitation identified was the lack of pharmacology knowledge, especially for communicating adverse effects, warnings and precautions during medicine use. Therefore, the manual should be understood as an initial didactic support,

not as a substitute for technical training, and it needs to be complemented with specific modules on applied pharmacology and pharmaceutical care.

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AI USE STATEMENT

The authors declare that they did not use generative AI in the preparation of this article.

APPENDIX

Applied instrument

ENCUESTA DIRIGIDA A DEPENDIENTES DE FARMACIAS COMUNITARIAS DE LA CIUDAD DE RIOBAMBA

IMPLEMENTACION DEL MANUAL DIDÁCTICO DE DISPENSACIÓN DE
MEDICAMENTOS DE VENTA LIBRE EN LAS FARMACIAS
COMUNITARIOS DE LA CIUDAD DE RIOBAMBA

Previo Posterior

La presente herramienta de toma de datos es de uso investigativo, el participante está de acuerdo con entregar la información verdadera y participar en el proyecto de forma voluntaria.

¿Qué es la dispensación?

¿Conoce usted el documento emitido por el ministerio de salud, "Manual de atención farmacéutica en las farmacias de la red pública integral de salud, red privada complementaria y en las farmacias privadas"?

SI

NO

CONSIDERE EL SIGUIENTE CASO

Se presenta un cliente a la farmacia sin receta, indicando una serie de síntomas que se considerarían leves, dando como resultado influenza estacionaria (gripe), en base a la experiencia y conocimientos responda las siguientes preguntas:

¿Qué indicaciones entrega en la dispensación de medicamentos?

Entrega usted advertencias acerca del uso de los medicamentos seleccionados, indique ¿Cuáles son estos?

¿Aparte de las recomendaciones de uso, que otras pudiesen ofrecer al paciente?

De la siguiente lista de síntomas identifique ¿Cuáles son banales y aptos para dispensar medicamentos de venta libre?

Síntoma	SI	NO
Dolores en el pecho		
Dolor de cabeza		
Dolor muscular		
Fiebre alta		
Punzadas en el vientre		
Malestar estomacal		
Tos		
Congestión nasal		
Alergia respiratoria		
Hinchazón de extremidades		
TOTAL		

N°