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**Original Research**

# Pharmaceutical intervention in the pharmacological therapy of elderly patients in San Luis-ECUADOR

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**Abstract**

Population's aging leads to a frequent usage of pharmaceutical medications to treat or control various ailments because of aging, increasing the probability of occurrence of problems related to its usage. The primary objective of this study was to conduct pharmaceutical interventions in elderly patients from San Luis – Riobamba, using surveys to identify the sociodemographic characteristics, diseases, and medicines usage. Once the problems related to pharmacological therapy were identified, pharmaceutical interventions were carried our prior the acceptance of each patient. The study had the participation of 422 elderly patients, with the prevalence of females (59.7%), aged between 60 and 70 years (45.5%); we identified that 82.5% of the elderly patients have diseases, finding that joint pain such as Arthritis/Osteoarthritis has the higher incidence (38.8%), and 50% of the surveyed people consume medication to treat the disease. 40.28% (n=170) of the participants conciliate the treatment review to identify any medication-related problem (MRP), finding interactions (21.2%) and adverse effects probability (21.2%), starting from the PRM identified, 170 pharmaceutical interventions were conducted, considering as priority (67.6%) the education on non-pharmacological measures. The pharmaceutical interventions done through the study benefited the elderly patients and will contribute to reduce the appearance of PRM.

**Keywords:** pharmaceutical intervention; elderly patients; MRP

## INTRODUCTION

With the pass of the years, elder population have increased worldwide and with this phenomenon, the use of medication to treat several diseases that affected them has increased,[1,2] which cause the appearance of problems related to their use. Medication-related problems (MRP) are events or circumstances related to pharmacotherapy that potentially interfere with the expected health outcomes.[3,4]

The MRP cause up to 30% of hospitalizations in elderly patients, and it has been detected that 53% of the prescriptions are inadequate for the elderly patients that inhabits the San Luis community, demonstrating unnecessary or contraindicated medications, overdosing or too long treatment duration.[5] All the factors previously mentioned require a meticulous prescription process, considering the profile of each patient to prevent health issues and waste of resources in public healthcare.

The administration of medication in elderly patients is critical because it is necessary consider variations in pharmacokinetics and pharmacodynamics due to age, correct understanding by the patient and very clear indications by the prescriber, as well as the selection and dispensing of the medicine on the numerous scenarios in which we they can be found, such as retirement homes, hospitals, primary care centers and pharmacies in the community.[6-8]

A strategy that has been used for years to prevent these problems is the use of Pharmaceutical Interventions (PI) in the treatment that this age group receive, in which the pharmacist promotes a rational and adequate use of medications through a full assessment in the pharmacotherapy of the patient.[9] Thus, the aim is to reduce the occurrence of MRP and improve the life quality of the patients.

A study conducted by Roberts et al., demonstrated satisfactory results of the application of clinical pharmaceutical intervention for the right use of medications. In this study is mentioned that the PIs were applied in 52 retirement homes, finding that the use of medications in the studied group was reduced by 14.8% in relation to the controls, which means a 64 dollars' annual savings in medical prescriptions.[10] In addition, in different research it was performed 237 PIs in 50 hypertense elderly patients, which led to an increase (84%) in therapeutic adherence, solving 82.76% of the negative results associated with the medication used.[11]

With this context, the objective of the study was to perform pharmaceutical interventions in the pharmacological therapy of the elderly patients in San Luis-Ecuador, and with this

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information, promote the adequate usage of medication, in addition reducing the cost of unnecessary medication in the public healthcare system.

## METHODOLOGY

The study was descriptive, prospective, non-controlled performed in San Luis (Riobamba – Ecuador). The population consisted of 422 adults over 60 years. First, an interview was conducted employing a survey to identify sociodemographic characteristics (age, gender, etc.), diseases and medication use. The next step was to identify problems related to pharmacological therapy; this was necessary to proceed with the pharmaceutical interventions after each patient's acceptance by signing an informed consent.

For the data collection it was employed structured files with the required information, and then *Statistical Package for Social Science* (SPSS) version 20 was used for statistical analysis. Categorization of the MRP and the pharmaceutical interventions were performed based on the pharmacotherapeutic follow-up established in the Dáder method.[12] It is important to mention that the study count with the approval of the San Luis local government.

## RESULTS

422 elderly patients were interviewed, being females (59.7%) the predominant. The age range between 60 to 70 years had the highest percentage of appearance (45.5%), the average height was between 1.40 – 1.50 (m) (47.2% of the population). The sociodemographic features identified are shown in detail in the Table 1.

Table 1. Sociodemographic features of the population

| **VARIABLES** | | **(%)** |
|---|---|---|
| GENDER | Masculine | 40.3 |
| | Femenine | 59.7 |
| AGE | 60-70 (years) | 45.5 |
| | 71-80 (years) | 32.5 |
| | 81-90 (years) | 17.8 |
| | > 90 (years) | 4.3 |
| BODY MASS INDEX | Normal | 44.3 |
| | Overweight | 41.2 |
| | Obesity I | 12.8 |
| | Obesity II | 1.4 |
| | Obesity III | 0.2 |
| EDUCATION LEVEL | Primary | 38.4 |
| | Secondary | 3.3 |
| | Degree | 2.8 |
| | None | 55.5 |
| HOUSEHOLD TYPE | Living alone | 11.8 |
| | Married | 38.9 |
| | Sons | 43.4 |
| | Other relative | 5.7 |
| | Other non-family | 0.2 |

We identify that 82.5% of elderly patients have diseases, finding a higher incidence (38.8%) corresponds to joint pain illness such as Arthritis / Osteoarthritis, in addition, we observed that the consumption of meditations occurs in 50% of the surveyed population (Table 2).

40.28% (n=170) of the participants accepted a review of the pharmacological treatments to identify any medicine-related problem, finding interactions (21.2%) and probability of adverse effects (21.2%) (Table 3).

Based on the identified MRP, 170 pharmaceutical interventions were performed, education on non-pharmacological measures was considered as a priority (67.6%) (Table 4).

## DISCUSSION

The predominance of females in the studied population (59.7%) coincides with the national statistical reports and the world statistics.[11,13] A high number of women in the analyzed location could be due to a longer life expectancy, due to the ovarian hormones' role (estrogens and progesterone) that regulate and enhance the immune response,[14] also different indicate that women attend more frequently to general medicine consultation than men. The Guevara A. study, in 2022 indicates that, from 144 elderly patients, 777 women (67.90%) and 467 men (32.10%) attended to general medical consultation.[15] The most relevant age range was between 60 to 70 years (45.5%), according with the bibliography, people in this age range have good physical condition, however, it decreases over time considerably.[16] The body mass index identified in the population supports this theory, because 44.3% of the participants presented normal values, which could be because elderly patients in the area continue practicing agricultural activities, which decrease de occurrence of diseases and favors a lower rely of medication (50%).

We detected that 55.5% of the participants did not present any level of education. According to an investigation conducted in Spain, people without studies presented a greater consumption of medications, thus, a greater probability of appearance of MRP.[17] Also, we found that the highest percentage of elderly patients live accompanied by their sons (43.4%), which is important because they help to comply the pharmacological and non-pharmacological therapies.[18]

Most elderly patients present any type of disease (82.5%), because the older they get, the occurrence of physiological alterations in the organism increase. We can see in Table 2 that Arthritis/Osteoarthritis is the most common (38.8%), comparable results to those reviewed in the literature, because the mentioned diseases are common in advanced ages, however, arthritis can also be found in low percentages

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Table 2. Diseases and medicines consumed by elderly patients

| | | (%) |
|---|---|---|
| Diseases Presence | Yes | 82.5 |
| | No | 17.5 |
| Main Diseases | Arthritis/Osteoarthritis | 38.8 |
| | Hypertension | 13.2 |
| | Neurological | 8.6 |
| | Visuals | 8.6 |
| | Diabetes | 6.3 |
| | Thyroid | 6.0 |
| | Auditive | 5.2 |
| | Gastritis | 4.0 |
| | Cholesterolemia | 2.9 |
| | Respiratory | 2.6 |
| | Cardiacs | 2.3 |
| | Psychological | 1.4 |
| Medicine Consumption | Yes | 50.0 |
| | No | 50.0 |
| Medicines | Paracetamol | 20.9 |
| | Losartan | 19.9 |
| | Hydrolyzed collagen | 10.9 |
| | Levothyroxine Sodium | 10.4 |
| | Vitamin Supplements | 8.1 |
| | Metformin | 7.1 |
| | Enalapril | 5.2 |
| | Diclofenac | 4.7 |
| | Calcium | 4.3 |
| | Insulin | 3.3 |
| | Omeprazole | 3.3 |
| | Simvastatin | 1.9 |

Table 3. Medicine-related problems (MRP)

| **Medicine-related problems** | **%** |
|---|---|
| Interactions | 21.2 |
| Probability of adverse effects | 21.2 |
| Non-compliance | 20.6 |
| Personal features | 10.0 |
| Inadequate storage | 9.4 |
| Doses. administration regime | 7.6 |
| Misadministration of medication | 4.7 |
| Prescription error | 2.4 |
| Dispensing error | 1.8 |
| Duplicity | 1.2 |

in young people.[19] All this information is consistent with the medication most used (Table 2) since paracetamol (20.9%) is used to relief pain and some pyretic process that occurs in Arthritis/Osteoarthritis.[20]

From the patients who consumed medications and agreed to have their prescription analyzed (n=170), the identified MRP (Table 4) indicates that the interactions and the probable occurrence of adverse effects are the more frequent. These results are similar to other investigations, such as those from 2005, which analyzed the features of the pharmacological prescription in elderly patients, 170 patients were evaluated, finding 1535 pharmacological prescriptions of 121 different medications and 295 potentially inappropriate prescriptions, which represented the 19.2% of the total; the previous information allowed to correlate inappropriate prescription with polypharmacy and the number of admission diagnoses.[21] On the other hand, in a prospective study conducted on emergency room admitted patients,[22] it was found that hospitalizations for adverse medicine events in elderly patients represented 5.5% of the total admissions, 20.6% of this group had adverse events with previous prescriptions and 82.5% of the cases were given the correct doses, agreeing with Oscanoa,[23] whom found inadequate prescription (45.8%), lack of adherence (63%) and adverse reactions presence (24%) as frequent MRP in elderly patients when they were hospitalized.[24,25] In the study once they evidenced these MRP, in these pharmaceutical interventions were applied, which practice is essential to comply optimally with pharmacotherapy, for which more actions focused on the

Table 4. Pharmaceutical interventions

| **Intervention** | **%** | **Category** | **Intervention** | **%** |
|---|---|---|---|---|
| Prescriber Level | 12.4 | Intervene on the quantity of medications | Administration regime modification | 2.4 |
| | | | Dose modification | 1.8 |
| | | | Frequency modification | 1.2 |
| | | Intervene on the pharmacological strategy | Add a medicine | 2.9 |
| | | | Remove a medicine | 2.9 |
| | | | Replace a medicine | 1.2 |
| Patient Level | 87.6 | Intervene on the patient education | Educate in non-pharmacological measures | 67.6 |
| | | | Educate on medication use | 12.9 |
| | | | Modify treatment skills | 7.1 |

patient were performed (87.6%), focusing on educate about non-pharmacological measures (67.6%) to avoid the occurrence of more diseases and therefore a higher use of medication.[26] While other investigations present different results, because the prevalence of interventions at the prescriber level turns out to be the most common.[1,27]

The intervention conducted at the patient's level had an acceptance of 100%, compared to the one conducted at the prescriber's level (0%), the last intervention was not accepted due to lack of information with the doctor, besides, it is about patients of the community who visits the prescriber again when they complete the treatment or do not return because they notice an improvement in their ailments.

## CONCLUSIONS

Elderly patients are an age group that presents diseases more frequently due to biological processes of aging itself, which leads to a higher consumption of medications and the occurrence of problems related to them. Pharmaceutical intervention is a key strategy to improve compliance with the pharmacological therapy in patients and reduce the occurrence of MRP, in addition, we found high percentage of elderly patients collaborated with the pharmacist to comply with the intervention for the benefit of their health. Thus, we recommend the integration of the pharmacist in the process of patients' therapy monitoring, so that there is a better control of therapy compliance and to avoid health problems that generate a higher cost and in an extreme scenario, death.

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