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Qualitative study on antibiotic management in households: perception of family caregivers

Estudio cualitativo sobre la gestión de los antibióticos en los hogares: percepción de cuidadores familiares

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Abstract

The available literature shows quantitative studies on the management of antibiotics; however, few investigations describe the perceptions and experiences of family caregivers with a qualitative approach. To explore the perceptions of family caregivers who manage antibiotic medications at home. Qualitative, descriptive scope and cross section. The information was collected through semi-structured interviews with caregivers with relatives who have a chronic degenerative disease, and without studies related to health care. Antibiotics have limitations at the time of access, which influences the storage that families have in their homes, the storage characteristics lie on the site and not in the container. Caretakers do not check expiration dates; medicines are discarded without established measures. The perceptions of caregivers in rural contexts differ from those in the urban context. Caregivers participate in the medication management process and recognize that they can improve their practices, therefore, the perceptions of access, storage, use, and disposal are necessary for improvement proposals.

Keywords: Home caregivers, Antibiotics, Qualitative approach.

Resumen

La gestión de antibióticos en los hogares abarca el acceso, almacenamiento, utilización y desecho, siendo los cuidadores los principales responsables de estas actividades. La literatura disponible muestra estudios cuantitativos sobre la gestión de antibióticos, sin embargo, pocas investigaciones describe las percepciones y vivencias de cuidadores familiares con un abordaje cualitativo. Explorar las percepciones de cuidadores familiares que gestionan medicamentos antibióticos en sus hogares. Cualitativo, de alcance descriptivo y corte transversal. La información fue recolectada mediante entrevistas semiestructuradas a cuidadores con familiares que tengan alguna enfermedad crónica degenerativa, y sin estudios relacionados con la atención sanitaria. Los antibióticos tienen limitantes al momento del acceso, lo cual influye con el almacenamiento que tienen las familias en sus hogares, las características del almacenamiento radican en el sitio y no en el contenedor. Los cuidadores no revisan las fecha de caducidad; los medicamentos son desechados sin medidas establecidas. Las percepciones de los cuidadores de contextos rurales difieren de los del contexto urbano. Los cuidadores participan en el proceso de gestión de medicamentos y reconocen que pueden mejorar sus prácticas, por lo cual, las percepciones del acceso, almacenamiento, uso y desecho son necesarias para propuestas de mejora.

Palabras clave: Cuidador de familia, Antibióticos, Análisis Cualitativo.

Introduction

Medicines or drugs are one of the fundamental tools in current therapy, along with the execution of an adequate medical diagnosis they allow the cure of diseases, attenuation of signs and symptoms derived from diseases, as well as the prevention of complications from acute or chronic and degenerative diseases (Vera, 2020).

Within the functional groups of drugs, antibiotics are substances that, through different mechanisms, can cause death (bactericidal) or reduction of reproduction (bacteriostatic) during a bacterial infection (González et al., 2021).

These medicines have great health value for their contribution to disease control and for improving the life quality; Also, they have a superlative value for families, because they represent a good with a high economic cost, as well as a short-term response to health problems The social relationship between people and medicines is the object of study of the social pharmacology, declared as the discipline in charge of analyzing the impact on social and cultural factors have on access, use, storage, final disposal, and effects of medications, including antibiotics. (González et al., 2021).

Thus, drug management covers all procedures related to it, and includes the selection based on its certified quality, safe use by the patient, as well as its regulated disposal to protect the environment (Rodríguez and Roig, 2020).

Despite the benefits of drugs on the quality of life, it is reported that there is a phenomenon of inappropriate consumption, derived from the excessive and irrational use of these drugs: The Antimicrobial Resistance (AMR), defined as the ability of a bacterial microorganism to resist the effects of antibiotics; through an inherent characteristic of the bacterium or a capacity acquired during the infectious process (Cerezo et al., 2020).

According to the United Nations Organization (UN), this phenomenon is considered one of the main global threats, since it endangers priorities such as human development, economic activities, the food sector, tourism, and migratory flows; which is why this is one of the main universal problems along with climate change (González et al., 2019).

AMR harms people's lives since it produces: the failure of common treatments; increased morbidity and mortality, as well high costs of care by the public system or out-of-pocket costs for the patient; also it can cause delay in establishing adequate treatments; increased use of broad-spectrum antimicrobial drugs; additionally, this can contribute to the failure of medical procedures that depend on the effectiveness of antibiotics (for example, chemotherapy, transplants, kidney dialysis, etc.) among others (Lazovski et al., 2018).

Although the understanding of the magnitude and severity of AMR is widely studied in hospitals, mainly through bacteriological identification studies or focused on the therapeutic of diseases, the lack of resources and heterogeneity in the populations make it difficult for study the behaviors that can lead to this phenomenon (Vargas et al., 2018), especially when the aim of the studies is the how or why of the habits of management at home can cause AMR. (Cerezo et al., 2020).

It's vital to understand the following: most people outside the clinical/pharmaceutical field tend not to get involved in the responsibility that comes with having drugs at home or to deal with the harmful consequences or actions that these can trigger. This lack of skills or abilities tends to be enhanced when the people living in the home suffer from multiple illnesses (especially chronic, mental related, or degenerative) since it leads to the phenomenon of polypharmacy, meaning, the use of multiple medications, generally more than five drugs a day (Sánchez et al., 2022).

Several studies describes that home caregivers, who are family members, have an important role during the treatment of chronic and degenerative diseases because they participate in activities related to the management, order, monitoring and taking of medications, in addition, they carry out actions in the way of accessing medicines, treatment follow-up, and also ingestion it at the established times and doses, and on some occasions, they are the ones who administered (Noureldin and Plake, 2017, cited in Carreño-Moreno et al., 2022).

Furthermore, family caregivers assume the responsibility of meeting care needs, contributing to the adaptive processes of the disease, obtaining, and controlling medications (González and Crespo, 2020; Laguado-Jaimes, 2020). Various treats can affect the responsibility, capacities, and abilities of these caregivers in the management of antibiotics. For example, González and Crespo (2020) mention that most of the home caregivers do not have training on the care at home that the sick person should receive, although, they are usually characterized by a high degree of commitment to tasks, which is determined by the affective relationships between caregiver and patient, in this case, family members.

Other characteristics are the minimum and necessary skills of home caregivers to manage medications, which is based on meeting the basics to meet the needs of the patient and the treatment, such as: understanding the prescription, reading the indications on the drug, and being aware of the expiration date, to execute their roles effectively and safely.

Finally, it is crucial to point out that in order to design and develop effective interventions that involve family caregivers, those who participate in the medication and antibiotic management process, is required to include the perceptions of the practices they perform, and based on the findings perform action strategies, support programs and preventive education sessions for caregivers can be generated that could allow: reinforcing knowledge about the disease and thus improving the lifestyle of patients to support them, while reducing the impact and the wear and tear generated by being the primary caregiver of people living with one or more diseases (González and Crespo, 2020).

For all of the above, the objective of this study is to explore the perceptions of family caregivers who manage antibiotic medications in their homes.

Materials and methods

The present study is of a qualitative approach, observational design, and descriptive scope, carried out during the months of august to October of 2022 in an urban area of the municipality of Yucatán.

On the participants selection, the snowball technique and sampling by criteria was used, these last ones included: people who handle medications in their homes and lives with a relative with metabolic diseases, immunological diseases, or some type of cancer, people who handle medications in their homes and live with children, the elderly, or a family member with mental health conditions. For this study, people with training in health sciences or who live with a family member with that profile, as well as minors who handle the medication at homes or outside the study area, were excluded. The number of participants was defined based on the principle of theoretical saturation.

For the recollection of information, semi-structured interviews were carried out supported by a question guide built based on the work of West and others (2020), Pham Duc and Sriparamananthan (2021), and David and others (2022). The guide was

validated by experts in the field of social pharmacology, also experts on the development of instruments, and researchers, who made recommendations on the wording and language to facilitate its understanding. The categories on the question guide can be seen in Table 1. All the interviews were collected through voice recorders by a researcher and an observer at the participants' homes. Also, non-participant observation was used to verify the drug storage sites, these impressions were collected through field diaries.

For the analysis of the information, the proposal by Taylor and Bogdán was used, which includes three phases: rediscovery, codification, and revitalization of the data. Among the criteria of rigor to ensure the reliability of the testimonies, credibility in the construction of the question guide, audibility through recordings, transcripts, and observers, and finally, the transferability of the information was taken into account (Cueto, 2020).

Finally, this research has the approval of the Ethics and Research Committee of the Faculty of Nursing of the Autonomous University of Yucatan. Also, the bioethical and research criteria established in the Declaration of Helsinki and the General Health Law on research for health in human beings of the United Mexican States, in article 100, fifth title, were met respected (Chamber of Deputies of the H. Congress of the Union, 2022).

Table 1. *Categories and subcategories explored in the interview guide.*

Category	Subcategories	No. of Questions
Access to antibiotics	• Antibiotic prescription • Informal access • The role of the physician • The role of the pharmaceutical industry	3
Antibiotic Home storage	• Container or first-aid kit • Storage house places • Household characteristics that could deteriorate the antibiotics	4
Antibiotic manager features (Family Caregiver)	• Minimum knowledge or skills to have. • Social and demographic characteristics that could affect the antibiotic management.	3
Expiration and final disposal	• Expiry dates management • Reasons for storing expired antibiotics.	7

	• Comparison between rural and urban areas • How to Improve behaviors

Source: Research team.

Results

Sociodemographic data

The interviews were conducted with a total of 13 people, ranging in age from 20 to 80 years, with an average age of 38.3 years. Regarding sex, 3 men and 10 women who live with older adults, people with chronic or metabolic diseases (Type 2 Diabetes, Systemic Arterial Hypertension, cancer, dyslipidemias, and some mental health diseases) participated, in terms of occupation, the majority were unpaid domestic workers, employees in companies not related to health and pensioners.

Regarding the characteristics of the context zone, the study site is in an urban area, in the state capital, and has access to public and private sector pharmacies, and informants distributed in the south and east of the city who have a medium-low and medium high socioeconomic level. The declared categories are described below.

Access to antibiotics

The antibiotic management process begins with access, which, according to the recollection, describes the drugs in general are easily accessible to the population, without there being any regulation involved, with the current purchase available in local stores, pharmacies, markets and even being able to share them among the same family. However, a distinction is identified between access to antibiotics, the latter being more regulated and exclusively sold with a prescription, after a consultation.

"…There are pharmacies that sell you the medicine without a prescription and it is easier to obtain them. The same is true in certain markets [tianguis] the medicines are already being sold…"

E11. Women. 25 years

"…[Antibiotics] have more control because not everyone sells it to you, that is, if you don't have your prescription, you have to go consult, they have to give you your prescription and you take it so they can sell you the antibiotic. Yes, some antibiotics may indeed be left over, and you keep it, but you cannot go buy others when you run out, you must consult again…"

E5. Woman.45 years

Also, different people and activities are perceived that facilitate these processes: doctors, when making a prescription for treatment and dosage of medicines that have surpluses; the pharmaceutical industry, due to the number of products for sale, by bringing a excess of elements (tablets, capsules, milliliters, etc.) in its commercial

presentation in relation to the amount that must be consumed according to the treatment, the excessive sale through of promotions, as well as the recommendation of which to buy, with the exception of antibiotics that are recognized as requiring a prescription.

"…For example, if they give you a 20-day treatment, but the box of tablets contains 15; you have to buy 2 boxes, and you would already have 30. You have 10 tablets left over; those are the ones you save for later. Sometimes it is not used, but you have them just in case because you really don't know when you are going to need it..."

E4. Women. 39 years

In continuity with the management process, there is a relationship between access and storage of antibiotics, because when requiring a medical prescription for their purchase, it is decided to protect the surpluses or leftovers, due to the suspension of the treatment due to presenting an improvement. o Reduction of symptoms or the number of doses they bring, since the population intends that in this way they have an immediate reach, to save time and money in the event of having a condition with similar symptoms in the future.

"…We usually store medicines and antibiotics because the boxes often contain more pills than we need and, in our longing, to save for future emergencies, we simply keep them, and they remain …"

E9. Women. 35 years

Home Storage

In the storage of medicines, there are varieties concerning the container, in this study mainly cardboard/wooden boxes and plastic bags were identified. The perception of the informants about the features must be met for antibiotics to be safe focuses on the physical location of the home where they are stored, rather than on the container itself, and they must have the following characteristics: be a clean place, without humidity or exposure to the sun or heat, as well be placed in a reachable place of protection, out of the reach of infants. These perceptions are supported by the following testimonies:

"…Medications must be picked up [save them] and keep them in a safe place so that the children do not get them, so that the sun does not hit them and they do not get wet. It doesn't matter if it's a cardboard box, plastic, or a bag..."

E7. Women. 29 years

"...If the place is very humid, even if you put a special container for some pills, it will get wet, they will swell and decay, it depends on the place, not the container..."

E8. Man. 38 years

Manager aspects

Regarding the person managing antibiotics, it is expected that they are in the adult age, that they know how to read and have empirical knowledge about the use and classification of these, and for which common symptoms and diseases in the family the antibiotics are effective.

Likewise, the sociodemographic profile of the person managing medicines and antibiotics is women in adulthood, since a greater responsibility is perceived in this sex when performing the role of caregivers, unpaid domestic workers, closeness and affection with the family, roles that are delegated from previous generations.

"…I think housewives and mothers are the ones who handle medications the best, men can also handle medications, but the truth is, I think it is more common for women to do so. For example, in my family I manage it, my sister manages it in her family, in my brother's house it is managed by her wife, in the house where I grew up my mother handled the medicines, she oversaw them…"

E4. Women. 39 years.

Expiration dates and disposal.

About the care around the expiration of medications, the informants perceive that it is common for it to happen in homes, due to the lack of time, consumption, and information regarding care in the use and disposal of these, since they are only checked before taking them and not during the storage time.

On the other hand, the reason for the disposal of medicines was perceived by the informants as a common practice when they expire, due to the lack of effectiveness that it may have or even the danger of their consumption. Waste actions are divided according to the type of substance or state of the drug, that is, liquid or solid (tablets, pills, or capsules); the first ones are emptied on the ground, in the toilet, or in the household sink and only the container is deposited in the trash, while the second type is disposed of in the common trash with the box, the blister and the medicine as a whole since it is perceived that otherwise, it could cause contamination to the environment.

"…Sometimes, due to work or school reasons, we do not follow up [on expiration dates], but I think that we all really store expired medicines, some even medicines that have already expired for a long time…"

E10. Women. 21 years

"…I throw the medicines in the trash. For example, if it is syrup; First I throw the medicine in my patio or in the sink, and then I throw the little bottle in the trash..."

E5. Woman.45 years

Rural and urban contexts

In the first place, it is understood that the management of antibiotics presents differences according to the context in which patients and caregivers operate, thus, divergences are perceived in the different stages, such as access, since the Urban cities

areas have an easier time buying them, due to the proximity and availability of medical establishments and pharmacies; secondly, in storage, rural areas have aggravating climatic conditions in this process, regarding humidity and heat, in addition to deficiencies in basic housing services that can cause medicines not to be correctly stored. Finally, in the use and disposal, in rural areas, there is less dissemination of reliable information about how to take the proper doses, check expiration dates, and proper disposal.

"…I think that marginalized communities are at risk of worse storage due to different factors such as how easy it is to obtain a container to store them in, the conditions in which they live because I know that many communities do not have access to electricity, air conditioning or a fan, so I feel that they are more exposed…"

E10. Women. 21 years

Improvements in the management of drugs and antibiotics.

The people interviewed make it possible to identify the forms of access, storage, use, and disposal of medicines and antibiotics, in conjunction with each of the responsibilities of the actors involved in the process, however, it is perceived that, in the disposal phase, most failures occur, because there is no guidance, information or follow-up on them.

Based on the testimonies of the informants, the need to generate and disseminate simple and clear information regarding the constant review of the expiration date of the drugs, accompanied by precise instructions on how to dispose of them, is identified as an opportunity for improvement.

"…Well, I think that for improvement, information must be given, that is, that they know that she must check the expiration date and discard those that are not good. I really do not know…"

E5. Woman.45 years

The use of antibiotics in the therapy of diseases is one of the most important discoveries in medicine and the world since it saves the lives of millions of people. That is why antimicrobial resistance is fast becoming one of the most serious global problems we face today. Therefore, the habits of prevention of this phenomenon around the use of medicines and antibiotics from their access to their disposal or final storage becomes vitally important to prolong the useful life of antibiotics and reduce the effects of diseases on the family's well-being (Sulis and Gandra, 2021).

Access to antibiotics derives from family access to health services. In economic terms, this means a lack of accessibility or affordability to these drugs, while in health terms it implies the absence of economic, cultural, and geographical barriers for the use of these drugs. In this research, the participants identify that antibiotics present barriers when obtaining these drugs from pharmacies, this coincides with what was reported by Hsia and others in 2019, who established that low- and middle-income countries have

difficulties accessing antimicrobials, due to a low supply of medicines, especially in rural areas and with high poverty rates, coupled with the fact that private pharmacies regulate access with medical prescriptions as well as their prices (Hsia et al., 2019).

These behaviors can lead to informal access when purchasing, as stated by Auta, Hadi, and Oga, who in a systematic review with meta-analysis establish that in low- and middle-income countries, up to 62% of antibiotics could be without a prescription (Auta et al., 2019).

The storage of antibiotics is a key component in the entire phenomenon of antibiotic management in homes since the participants identify that storage is directly related to access (through the purchase or obtaining of medicines) and consumption of these, when comparing results of this paper an Australian team that described the perspectives, attitudes, and behaviors of people towards antimicrobial resistance, they agree that storage is closely related to an irrational prescription, changes in the indicated therapy, excess of tablets for a single treatment and inadequate dispensing, while in use it is related to protection in case of appearance of similar symptoms in future illnesses (Lum et al., 2017).

Regarding the conditions where antibiotics and other medicines are stored, the participants identify that avoiding direct light and high levels of heat and humidity prevent these medicines from damaging their composition. This may be a belief associated with food consumption as described by Khan et al. (2022), who through interviews focused on knowing people's knowledge about the use of antibiotics report that when consumed orally, medications must be kept under the same conditions. It is important to establish that, even though these factors are known in most of the studies that evaluate the knowledge and practices of drug storage, most of the results (including those of this study) report that the most common storage space is the kitchen, where high levels of light, humidity, and heat can be experienced (Sodric, 2020; Hussain et al., 2019).

Likewise, the type and characteristics of the container stand out as areas of opportunity in improving storage practices, since the participants do not identify that a container with suitable characteristics can help keep their antibiotics in good condition. Eldalo, Yousif, and Alotaibi (2020) establish, in a study aimed at evaluating the storage, uses, and beliefs of medicines, that more than half of the participants identified that they should have an exclusive container to store medicines to ensure the conditions of the labels, prevent consumption in children and improve the monitoring of the quality of the drug, especially in tablets and syrups.

On the characteristics of the home medication manager, it is important to highlight that the participants describe that the administration of medications and antibiotics at home is part of the functions of the main family caregiver, and this role is highly influenced by gender, age, and the role played at home (older women, housewives), however, they also express some essential competencies to carry out this activity related to understanding the effect and characteristics of medication use. This topic is little explored in research, some approaches such as that of Mohammed and Gorski (2021)

describe that the family caregiver must have knowledge of how to prevent and identify infections, communicate the characteristics of the therapy (dose, time of consumption, diet, etc.) and monitor any side effects of the administration of antibiotics.

It is important to point out that the above characteristics correspond to home caregivers, who are usually not members of the family, and when the competencies of family member caregivers are explored, traditionally the social and family burden falls on women, setting higher expectations about their performance, which can create discomfort, feelings of anxiety, and mistakes in the caregiver (Audiffred, 2022). On the other hand, Lugova et al. (2020), identify that the knowledge of fathers versus mothers in the management of respiratory infections at home is significantly higher in mothers, which suggests a greater involvement of them in the care of illnesses at home.

Regarding the disposal of medicines, the findings are consistent with the conclusions on the research by Galindo (2019) who mentions that people have notions about the negative consequences for health and the environment that antibiotics can have when throwing them away. without some previous care or treatment, however, it is not possible to clarify the correct ways to do it. Likewise, the practices coincide in emptying the medicines first, using home methods, and leaving them for garbage collection.

The management of antibiotics is established as a process that requires minimum knowledge that adapts to the variable conditions of rural and urban areas, which will depend on awareness, promotion, and shared information, therefore, the less practice of these actions, the greater possibilities of errors in the use and proper disposal (Galindo, 2019); This information is relevant, due to the different perceptions between rural and urban areas, it was commented that in the former, reliable information that could contribute to improving practices is not received.

In the description of improvements in the management of antibiotics, the perceptions found are consistent with the recommendations issued in other investigations. For example, Serrano, Pacheco, Mesa, and Rea (2019), reported that it is necessary to disseminate available, close, and reliable information about the prescription, dispensing, use, and management of antibiotics, which, in turn, can generate a favorable change in behavior. However, this perception is contrasted, since in previous years Llor (2010) established that strategies aimed at both doctors and patients, such as discussion talks, computer alerts with reminders, or information brochures have different results depending on the population with which they are concerned.

The perceptions of the interviewees about the areas of opportunity of the disposal process by people who are not part of health teams and the responsibility of medical personnel coincide with the needs and recommendations described by Seguí (2022) who establishes that the doctor has their responsibility in terms of knowing the correct way to dispose of leftover medication, he adds that doctors can contribute to educating patients on the correct disposal of leftover medication and that every medical prescription must include a legend on the correct way to dispose of it.

Conclusions

People are aware of the informal management of medicines and recognize that they can improve their practices, but they do not have recommendations or skills to gather information and discern between appropriate and inappropriate management of antibiotics.

Regarding access, people identify the role of pharmaceutical companies, by having presentations with more doses than they need for a treatment, which automatically leads to the storage of antibiotics and other medicines at home. Likewise, in the storage of antibiotics, it is determined that it is closely related to access and a feeling of uncertainty of being able to access them in the future, whether due to regulations, price changes, or the time to go to consult, among others. Home caregivers perceive that the management of antibiotics is a process that consumes time and entails a high responsibility in the entire process, so they choose to keep them without a periodic review with the feeling that they can be useful again, in case of present the same symptoms, saving time and resources in accessing them.

The sociodemographic characteristics, specifically being a woman in adulthood, leads to expectations about the activities that "should" be carried out, so the storage of antibiotics generates a prompt solution to health problems that family members may present. Perceptions are a starting point to knowing where to direct interventions to change knowledge, behavior, and future public policies, since they are the guideline for carrying out effective and contextualized activities on these issues, that is, communication channels, media, and materials. diffusion, language to use, key actors in the health team, among others. For the mitigation of antimicrobial resistance, it is necessary to start with effective information that contains the minimum, basic, and essential elements to guarantee that families can exercise care throughout the management system, and the results presented are a first approach.

It is recommended to carry out this research with caregivers in rural areas to rescue perceptions of this context, especially in access and storage of antibiotics. Likewise, to observe if the phenomenon is related to individual variables (schooling, gender, lifestyles, concomitant diseases, family socioeconomic level, among others) or the social context (access to health services, private pharmacies, poverty, affordability, among others).

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