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INNOVATIVE DESIGN AND ORGANIZATIONAL MODELS FOR FUTURE PHARMACY MANAGEMENT SERVICES

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ABSTRACT: -
The architecture, organization, and arrangement of drug stores considerably affect a patient fulfillment. A well-planned physical layout does not only affect consumer perspectives but also has a direct effect on the potential sales as both improves and minimizes them. A well-planned pharmacy layout not only improves accessibility and minimizes error but also increases operational productivity tremendously. This article explores how schematic pharmacy designs of the future can be planned so that ergonomics, automation, and regulatory compliance are facilitated throughout the workflows to ensure smooth operation. Effective use of space, clear directions and signage, and considered shelving contribute to improved inventory management, and faster dispensing times. In addition, development of patient focused features, such as consulting rooms will maintain private and enhances level of individual treatment. Moreover, its positive effect on healthcare delivery is increasingly becoming evident (as information and telecommunication technology develop). With a new focus on preventative healthcare, pharmacists are integral to health education and medication adherence, both of which lead to healthier communities and, ultimately, improved patients' outcomes.

Keywords: - Pharmacy layout, Design, Customer comfort, Tele-pharmacy, Community pharmacy, Inventarycontrol, Services.

1. INTRODUCTION

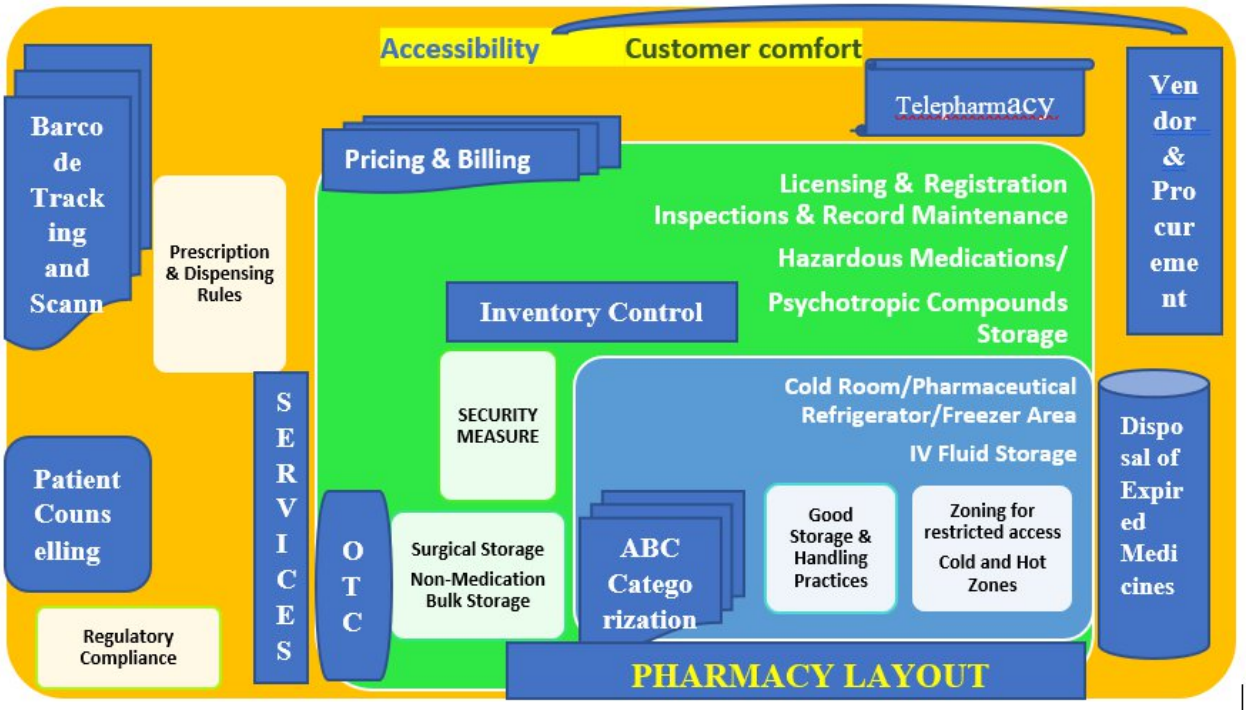
A pharmacy, also known in American English as a drugstore and in British English as a chemist's, is a retail shop that sells medicines A pharmacist fills prescription medications and guides clients on over-the-counter medication selection in a pharmacy [1]. This article explores how schematic pharmacy designs of the future can be planned so that ergonomics, automation, and regulatory compliance are facilitated throughout the workflows to ensure smooth operation [2]. Effective use of space, clear directions and signage, and considered shelving contribute to improved inventory management, and faster dispensing times. In addition, development of patient focused features, such as consulting rooms will maintain private and enhances level of individual treatment . Commonly, from the commercial parts of the societies, the pharmacies are placed over-the-counter drugs. A pharmacy is usually constructed in the local market area [3].

Visual Merchandising techniques allows customers into Pharmacy design It also covers the design format for dispensing areas, storage systems and consultation areas . This leaves no room for error as a carefully planned layout is vital for an impactful customer experience. It forms the basis of your store's floor plan and the layout of your fixtures, so you can see what you would like to do with your space and where you'll be placing your product [4]. A carefully designed layout provides an amazing shopping experience while driving sales potential. At the end of the day, the design of your pharmacy is going to influence how customers perceive and engage with each other. A great layout can enhance their experience and develop loyalty, whereas a bad one can send them away [5]. Community drug store, moreover known as retail drug store, is the foremost available and well-known drug store sort that's frequently found within the community or inside shopping markets. Ranging from dispensing medications to offering course of treatments and innovative personal care products, pharmacy are an essential part of healthcare system. They provide critical information and advice to ensure the community makes the right decisions for their health and well-being. Tele pharmacy similar to telemedicine's, is a newer concept that concerns provision of pharmaceutical services. The emergence of various models of telepharmacy has been the result of strategies Thich can overcome the obstacles to getting to drug store administrations. According by National Association of Boards of Pharmacy, telepharmacy is dispensing prescribed medication utilizing telecommunications and information technologies to communicate health-related services to patients who are in a different location. Telepharmacy is one Tele-pharmacy provides a of delivery of pharmaceutical products and care, through telecommunication to various patients. clinical pharmacy service. These way patients can things within the consolation of where they can get the administrations simple. Other administrations are taking medicines to farther places additionally labeling the frameworks.

2. PHARMACY LAYOUT

A drug store format could be a key course of action of racks, counters, shows, and other components inside the space to encourage smooth client developments and productive workflow for stasis. Physical format of store and the visual marketing techniques utilized to pull in and lock in clients. Components to consider when choosing a drug store format for your trade: There are various things you need to consider when selecting the finest organize for your sedate store. In a culminate world, the choice of the arrange is based on a significant understanding of client conduct, as well as on your advancing technique and the person properties of your retail space. It is imperative to induce it, that a arrange that works well for one particular sedate store, might not work for another [6]. To select the one that suits your drug store best, you will need to take into thought: Think about how customers usually navigate through your pharmacy and try to understand how they interact with your products(your customers and their buying habits). The sort of items you want to show. The accessible floor space as well as the person properties of the building. Your visual promoting procedure.

Figure 1: Pharmacy Layout



Pharmacy layout requirements:

2.1 . Accessibility

In a pharmacy accessibility means ensuring that everyone regardless of their physical abilities, language barriers, or other circumstances, can easily access and utilize the pharmacy's services and medication [7] as shown in (*Figure 1*).

2.2. Zoning for restricted access

Make particular zones to distinguish between OTC items and medicine drugs as shown in (*Figure 2*) that require the help of a drug store specialist [8].

2.3 Cold and Hot Zones

Finished pharmaceutical products, including medicines, vaccines, biologics, injectables, specialized therapies (gene therapy, etc.), or even active pharmaceutical ingredients (APIs), lose their effectiveness and may be rendered unsafe in extreme temperatures as shown in (*Table 1*).

2.4. Customer comfort

If space allows, incorporate seating areas where customers can wait comfortably or consult with pharmacists. The aim and measure of success of merchandising activities are to increase pharmacy sales, gain loyal customers, draw the customer's attention to the right products, and actively promote the entire range or specific items as shown in (*Table 2*) (Table 3) (*Table 4*) and (*Table 5*). As a bonus of compelling marketing, there's an increment within the time the client spends within the retail drug store industry, fortifying the brand and making strides benefit.

Undoubtedly, not adhering to cold storage guidelines can risk the reputation and business of pharmaceutical companies.

2.5. Regulatory Compliance

In India, pharmacy outlets are required to adhere to various laws and regulations to ensure lawful and ethical practices. The primary regulatory obligations include:

2.5.1. Licensing & Registration

Secure a Retail Drug License (RDL) or Wholesale Drug License (WDL) from the State Drug Control Department under the Drugs and Cosmetics Act, 1940. A registered pharmacist with a Diploma (D.Pharm) or Bachelor's degree (B.Pharm) must be employed. Shop Act Registration: Necessary under the Shops and Establishments Act. GST Registration: Essential if turnover surpasses the stipulated limit [14].

2.5.2. Compliance with D&C act 1940

Only sanctioned & licensed medicine may be sold. Prescription Drugs (Schedule H, H1, X) cannot be dispensed without a valid physician's prescription. Non-prescription (OTC) medicine can be prescribed without a prescription, but must adhere to labeling standards. Maintain accurate stock records and update them frequently.

2.5.3. Good Storage & Handling Practices

Temperature-sensitive drugs (e.g., vaccines, insulin) must be stored according to manufacturer instructions. Expired and damaged medications must be disposed of in accordance with regulatory procedures. Controlled substances (narcotic drugs) require special permission under the Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985.

2.5.4. Prescription & Dispensing Rules

Prescriptions for Schedule H & H1 drugs must only for three year. Schedule X drugs (e.g., narcotics) necessitate special licenses and meticulous record-keeping. Pharmacists are required to advise patients on dosage, side effects, and storage.

2.5.5. Pricing and Billing Compliance

Drug pricing must conform to DPCO (Drug Price Control Order) , 2013, instituted by NPPA (National Pharmaceutical Pricing Authority. MRP cannot be exceeded. Accurate tax invoices and GST compliance must be maintained.

2.5.6. Online Pharmacy Compliance

E-pharmacies are required to register with the CDSCO (CentralDrug Standard Control Organization. Compliance with IT Act, 2000 are necessary for safeguarding data and ensuring patient privacy.

2.5.7. Disposal of Expired Medicines

Adhere to Biomedical Waste Management Rules, 2016 for proper disposal. Return expired medications to suppliers or dispose of them through authorized channels.

2.5.9. Inspections & Record Maintenance

Maintain logs of purchases, sales, and prescriptions. Regular checks by the Drug Inspector are carried out to ensure adherence to regulations.

2.5.10. Regulatory Adherence in favor of drugstore design in India.

Retail Pharmacy: At least 10 square meters (approximately 108 sq. ft.) Wholesale Pharmacy: At l east 15 square meters (approximately 161 sq. ft.) Retail + Wholesale: At least 15 square meters.

2.6. SECURITY MEASURE

Safety protocols Security protocols within a pharmacy often encompass: monitoring cameras, entry control systems to limit access to permitted staff, safe storage for regulated substances (such as safes), alert systems, movement detectors, adequately illuminated outside areas,

conspicuous signage discouraging criminal activity, ongoing employee education on safety procedures, and meticulous stock tracking to identify potential irregularities.

2.7. Sort of drug store format

Depending on the sort of drug store you've got and the accessible floor space, there are various format options for you to select from. To assist you make an educated choice, we put together a brief direct on the different format plans you'll be able select from.

2.7.1. Grid layout

One of the most commonly used formats is the frame format. Often used in pharmacies, general stores and different retail stores, it promotes the use of settings and racks posted or "race"[15]. As an economic replacement, this is the perfect choice for pharmacies, because it allows the best space to use in a MOO to search for MOO. At the same time, it allows the most beautiful links and creates an effective atmosphere. There are well -set paths that allow customers to buy all your pharmacies. Even if this format can be a spacious choice for many people, it has its disadvantages as shown in (Figure 3). Therefore, the format of the network can create a sterile look, giving your pharmacy a always atmosphere. Due to its non -flexible structure, it can limit your alternative options in terms of planning. Therefore, this can make your pharmacy without caring and appearing too much for your customers.

2.7.2. Free-flow layout

If you find the grid format to be somewhat limiting, you might want to consider a free-flow design instead. True to its name, this arrangement provides maximum flexibility for your clients to explore your products [16]. Additionally, it enables you to showcase your items in various spaces utilizing diverse display tables and fixtures as shown in (Figure 4). This adaptability allows for more engaging designs. With a free-flow design, you have the ability to cluster different products together, creating excellent chances for cross-selling. Moreover, as there is no set route that customers are required to follow, this layout enhances customer interaction with your products and encourages browsing. Consequently, this can lead to spontaneous purchases. While a free-flow layout has many advantages, it also comes with its share of downsides. A significant downside of this setup for your pharmacy is that it requires a substantial amount of precious floor space and can be relatively expensive. Therefore, it might not be the most suitable choice for smaller pharmacies.

2.7.3. Loop or racetrack layout

Seeking a layout that strikes a balance between a structured grid and a free-flowing design? You might want to explore a loop or racetrack configuration. In this setup, a central pathway circles the store, directing your customers along a defined route. This pharmacy design presents a distinctive method for showcasing most of your merchandise. Additionally, it fosters a cozier and more inviting atmosphere compared to a grid setup as shown in (Figure 5). This could be an excellent option if you wish for greater design flexibility and aim to encourage spontaneous purchases. However, a key drawback of a loop layout is that it compels customers to navigate a predetermined route. This may frustrate visitors who enter your pharmacy with a clear intention of what they need. Furthermore, although this pharmacy format utilizes floor space more efficiently than a free-flow design, it doesn't maximize space usage to the extent that a grid layout does.

2.7.4. Herringbone layout

If none of the previously mentioned designs fits your pharmacy, we present one final alternative: a herringbone design as shown in (Figure 6). This arrangement is ideal for compact pharmacies

with a slender and elongated retail area because it features a singular aisle that traverses the store. By incorporating multiple pathways leading to the walls, this layout enables you to showcase a significant number of items within a limited area.

3. PHARMACY DESIGN

3.1. Site selection requirements:

Choosing a location is a crucial element for the success of any enterprise. Various elements need to be taken into account when determining the right site. The next points outline the criteria for selecting an appropriate location for a pharmacy[16]. Nearby hospital, drug store location is quite good because maximum patients are moving toward the hospital for treatment and also multi-facilities are available near to the hospitals. It was found that in good cities one is the common place known as 'Daba Bazar'. This is one ofthe most suitable location for drug store if potential is very high and dedication for business. The best way is to select left-hand side or right hand side of road where suitable parking place is available. Identify the purchasing power of particular side and select the location accordingly. Enough parking, toilets, small play ground etc., are always advisable particularly when you are selecting the location in the market. Near by Common Requirements (Hotel, School, Cinema, Play Ground etc.)

3.2 . Structural Design

3.2.1 Wall

The walls need to be constructed from non-absorbent materials and coated with plaster on each side. The interior wall surfaces must utilize washable antifungal paint, while the exterior surfaces should be treated with weather-resistant paint. For cold rooms, the walls must be made from specially designed building materials to avoid condensation.

3.2.2 Floor

The flooring must consist of concrete and have a smooth plaster finish. The material used for the floor's surface must be a durable, non-slip type capable of enduring significant weight and foot traffic. It is essential that the flooring is impermeable, moisture-resistant, and able to resist cleaning agents. The height from the floor to the ceiling should be between 15 to 30 feet, depending on the specific purpose of the space and the equipment being utilized.

3.2.3 Ceiling

The ceiling must consist of materials that are fire-resistant, free from asbestos, and do not shed fibers, or use mineral fibers.

3.2.4 Roof

The roofing must have an incline or slope to mitigate the risk of severe water damage from heavy rainfall.

3.2.5 Door

The entryways are to be constructed from materials that resist fire. Each door should consist of two panels and be adequately spacious to facilitate the seamless movement of supplies and machinery, including forklifts and stackers. The exit doors must be intentionally positioned and equipped with visible emergency exit signs.

3.2.6 Window

Windows should be present in workstations, offices, and employee zones, but they should not exist in storage locations[17].

3.3 Receiving Area

Loading and Unloading Area: This area should be adequately spaced and properly sheltered by taking care of the vehicle height.Receiving Counter: It should have adequate waiting space and should be equipped with suitable office furniture and equipment.Sorting and Unpacking Area: This area should be adequately spaced to enable the sorting and checking of goods. The space should be sufficient for the utilization of a forklift.Transit/Holding Area: The transit/holding area should be adequately spaced for storing: Items requiring further clarification/investigation before receiving, Transit items not requiring special storage conditions, and Pallets. Disposal Room: This room should store discarded items (like, used boxes, wrappers, and plastic covers).

3.4 Storage Area

3.4.1. Overall Storage Needs

The designated storage space must include air conditioning systems that operate continuously throughout the day. The internal temperature must be maintained between 16 and 25 degrees Celsius. Power sources for refrigerators, freezers, cold storage areas, and air conditioning units should be integrated with the hospital's backup power system. A computerized alarm mechanism should be linked to the hospital's primary electrical management system to identify any electrical malfunctions in cold chain devices. Sufficient room must be allocated for the use of forklifts, stackers, and trolleys, in addition to supporting IT infrastructure. The space should be outfitted with an adequate quantity of pallets, shelves, and racks.

3.4.2. Pharmacy

There ought to be flexible, robust, open shelving that can accommodate packages of varying dimensions. A sizable storage space should be allocated for larger stock. Heavy-duty plastic pallets must be in place to keep bulk products and sizable boxes elevated off the ground. These pallets should be constructed for forklift utilization, enabling transport of larger quantities effortlessly. The pharmacy must include a specific section marked with warning signs and equipped with a chemo-spill kit for hazardous drugs.

3.4.3. Hazardous Medications/Psychotropic Compounds Storage

This section is designated for the secure storage of hazardous medications/psychotropic compounds, so it must be secured with a lock and placed in a dedicated room or cabinet equipped with an alarm system.

3.4.4. Cold Room/Pharmaceutical Refrigerator/Freezer Area

The design of this space must align with the operational needs of the hospital. It ought to be located within the pharmacy for the preservation of medications needing cooler storage temperatures, such as vaccines, antisera, and various biological products. Each cold room/pharmaceutical refrigerator/freezer must include a computerized system for recording temperature accurately.

3.4.5. IV Fluid Storage

This section needs to be spacious enough to hold solutions for hemodialysis, peritoneal dialysis, and intravenous use. Additionally, it must allow enough room for the operation of a forklift [18].

3.4.6. Surgical Storage

This section is intended for the storage of large quantities of surgical materials, disposable goods, and X-ray films. It must feature sturdy, modular, and flexible open shelving. Sufficient space should be available to hold large items comfortably [19].

3.4.7. Non-Medication Bulk Storage

This section is intended for the storage of bottles for dispensing, various containers, labels, and envelopes. It needs to include robust, modular open shelving that can be adjusted. Sufficient space should be available to facilitate easy movement .

3.5 Vendor selection and ordering Procurement:

Vendor selection and ordering procurement in pharmacy involves the process of identifying and evaluating potential suppliers, selecting the best supplier(s) to meet the pharmacy's needs, and placing orders with the chosen vendor(s) for pharmaceutical products, medical supplies, and other related items[20]. Here are some steps involved in the procurement process for pharmacies: Determine the pharmacy's needs, identify potential suppliers, evaluate potential suppliers, Select the best suppliers, Negotiate contracts, Place orders, Track orders and performance.

4. SERVICES IN PHARMACY

4.1. Inventory Control Techniques

Efficient inventory management is crucial for running a pharmacy. Effective oversight can aid in cutting expenses, reducing excess, and guaranteeing that the pharmacy stocks the needed medications and supplies to cater to patient requirements [21]. Below are several prevalent inventory control techniques employed in pharmacies:

4.1.1 First-In-First-Out (FIFO) Approach

This strategy focuses on utilizing the oldest inventory first to lessen the chances of medication expiration or degradation. It is particularly beneficial for handling perishable goods such as vaccines.

4.1.2. Minimum-Maximum Strategy

This technique establishes a lower and upper threshold for each medication or supply. When the inventory dips below the lower limit, the pharmacy places an order to bring stock back up to the upper level .

4.1.3. ABC Categorization

This approach involves sorting items according to their significance or frequency of use [22]. Class A items are deemed the most critical and frequently utilized, whereas Class C items rank as the least essential and least used. This aids in directing inventory management efforts.

4.1.4. Ongoing Review Strategy

This technique requires consistent monitoring of inventory levels and ordering replacements as necessary. It is particularly effective for managing high-demand items that typically follow predictable usage patterns [23].

4.1.5. Barcode Tracking and Scanning

This approach utilizes a barcode system for monitoring inventory levels and overseeing stock. By scanning barcodes, products can be identified and usage tracked, which fosters precise inventory management and reduces the likelihood of mistakes [24].

4.1.6. Automated Inventory Management Software

This technique employs computerized systems to oversee inventory levels and streamline the ordering process. It enhances the efficiency of inventory management and guarantees accurate stock assessments [25].

4.2. Community Pharmacy

Community pharmacy operations refer to any establishment that operates under the direct oversight of a pharmacist, where pharmacy activities are conducted or where medication orders

are prepared and provided, excluding hospital pharmacies or pharmacies with limited services [26]. Professional duties of community pharmacists. The community pharmacist's function is to supply medications to patients according to their physician's prescriptions. Nevertheless, the responsibilities of pharmacists have evolved significantly, and they are now actively engaged in various health-related programs [27].

4.2.1. The responsibilities of a community pharmacist might involve:

- Handling prescriptions
- Medicating the patient
- Assessing for potential drug interactions
- Distributing medications
- Managing medication disposal
- Offering counsel
- Encouraging a healthy lifestyle

4.3. Good Pharmacy Practice

Pharmacists must provide high-quality services to all patients, guided by Good Pharmacy Practice. The profession is dedicated to promoting excellence for patient benefit, with public perception based on pharmacists' application of this commitment. Pharmaceutical education should focus on medicine use and relevant social sciences, while also prioritizing strong communication skills.

4.4. Patient Counselling

Patient counselling is essential for empowering individuals with the knowledge and support needed to manage their medications effectively.

For those in pharmacy, this is an important duty and a significant educational chance for learners. Pharmacists are essential in informing patients on the proper use of their medications, what outcomes to anticipate, and how to recognize possible adverse reactions and interactions with other drugs [28]. Numerous pharmacists have been educated in a reliable counseling technique created by the Indian Health.

4.5. Barriers to effective counseling

Types and strategies to overcome the barriers:

The information was gathered by incorporating a query regarding the presence and characteristics of counseling obstacles, should they be present, into the usual patient counseling document utilized by pharmacists [29].

Type of Barriers to effective counseling

Effective patient counseling in community pharmacy is a difficult task, due to the following barriers.

4.5.1. Pharmacist related barriers
4.5.2. Patient related barriers
4.5.3. System related barriers

4.5.1. Pharmacist-Related Barriers

- Insufficient understanding of the patient's unique background[30]
- Limited knowledge of the patient's specific disease condition[31]
- Lack of confidence or necessary skills in patient care[32]
- Preconceived attitudes and beliefs held by pharmacists[33]

- Generational differences impacting communication and trust[34]
- Cultural and religious disparities that may hinder rapport pharmacists[35]

4.5.2. Patient-Related Barriers

- Lack of trust[36]
- Lack of knowledge regarding non-verbal communication [37]
- Cultural or religious beliefs[38]
- Poor listening skills
- Lack of time
- Information overload
- Physical or mental status
- Emotional issues religious beliefs

4.5.3. System-Related Barriers

- Insufficient pharmacists available in the pharmacy.
- Limited time for patient consultations.
- Pharmacists lacking access to a patient's complete medication history.
- Ineffective communication between pharmacists and physicians.

4.6. Strategies to Overcome Communication Barriers

Communication barriers can be addressed through the following strategies:

- Use appropriate body language.
- Motivate the receiver to engage in the conversation.
- Ensure that it is a suitable time and place to communicate with the patient.
- Be clear and use language that the patient can understand.
- Communicate one idea at a time.
- Respect the patient's choice to refrain from communication.
- Confirm that the patient has understood your message correctly.
- Choose a distraction-free location for communication.
- Acknowledge any emotional responses the patient may have to what you say.

4.7 Over-The-Counter (OTC) Medications:

Over-the-counter (OTC) medications are those that can be purchased without a prescription from a healthcare provider.These medications are accessible to the general public and are usually used to treat common ailments and health conditions. Some examples of OTC medications:

a. **Pain relievers**
b. **Antihistamines**
c. **Cold and cough medications**
d. **Digestive aids**

Need and role of Pharmacists in OTC medication dispensing:

The pharmacist should advise the consumer to consult doctor for the necessary treatment. The drugs otherthan OTC medications should not be dispensed without prescription [39]. Pharmacists play a crucial role in thedispensing of over-the-counter (OTC) medications. In India, over-the-counter medications are widely available and commonly used by thegeneral public for self-treatment of minor ailments and health conditions [40].Some examples of OTC medications in India include pain relievers, cough and cold medications,antacids, and anti-allergy medications. The regulatory framework for OTC medications in India is overseen by the Central DrugsStandard Control Organization (CDSCO), which is responsible for ensuring the safety, efficacy,and quality of pharmaceuticals in India.In addition, pharmacists play an important role

in advising patients on the proper use of OTCmedications and checking for potential interactions with other medications [40].

4.8. Telepharmacy

Telepharmacy, similar to telemedicine, represents a modern method for providing pharmaceutical services. Efforts to alleviate challenges in accessing pharmacy care have given rise to various telepharmacy frameworks. The National Association of Boards of Pharmacy defines "telepharmacy" as "the provision of pharmaceutical care utilizing telecommunications and intelligent systems to serve patients from a distance [41]." Telepharmacy allows for the delivery of clinical pharmacy services and prescription filling at remote sites without the need for a pharmacist to be physically present[42]. Common telepharmacy offerings include reviewing medication orders, dispensing and compounding drugs, providing drug information services, counseling patients, and monitoring therapeutic drug levels [43]. As such, telepharmacy utilizes cutting-edge technology that allows a skilled pharmacist based at a central location to supervise a pharmacy assistant or technician in a remote area as they dispense medications through audio and video connections. Telepharmacy acts as a practical solution for continuous pharmacist medication reviews in distant hospitals [44]. Numerous healthcare institutions have embraced this approach as an alternative method for improving pharmacy access in areas lacking 24-hour pharmacy services. The growth of electronic health information systems and related tools, like fax machines and electronic health records, enhances the ability of pharmacists to review information before preparing a patient's medication. These advancements are advancing telepharmacy efforts and enabling pharmacists to improve medication management effectivel[45] .

4.8.1 Operation of telepharmacy

Typically, a small hospital, pharmacy, or clinic situated in a remote area is associated with a commonly used service model found in larger cities that provides enhanced accessibility (often all day and night) to pharmacy personnel [46]. This connection is facilitated by videoconferencing tools, advanced software, and automated medication dispensing systems. The rural establishment is usually staffed by pharmacy technicians or nurses, depending on whether it operates as a pharmacy or a clinic [47]. They may send prescriptions (for example, via fax) from clients at these sites to the main facility, where a licensed pharmacist processes them. However, automated dispensing systems are not always economically feasible for smaller rural hospitals or clinics [48]. A different approach was created by researchers in Fargo, North Dakota, where a technician, under the live supervision of a remote pharmacist via videoconference, prepares medications for dispensing, repackaging, and relabeling. These medications are subsequently either handed directly to the nurse by the pharmacy technician or distributed using automated dispensing devices (if available). In another case, to guarantee access to a pharmacist at all hours for doctors and nurses within the patient care area for direct consultation and communication, a mobile technology cart with wireless capabilities has been developed for use in remote hospitals.

A. Internet pharmacy

An online pharmacy, internet pharmacy, or mail-order pharmacy is a pharmacy that functions over the Internet and delivers orders to customers via mail, shipping companies, or an online pharmacy web portal. Internet pharmacies are digital drug stores that send medications to patients. As mentioned, internet pharmacy does offer a level of convenience for patients when conducted appropriately [46].

B. Telepharmacy

Telepharmacy operates similarly to any conventional pharmacy; the pharmacist's scope of practice remains unchanged. Everything a pharmacist performs in a traditional pharmacy, they do in a telepharmacy. When a patient visits a telepharmacy, they receive an almost identical experience as they would in a conventional pharmacy. The process functions just as it does with a traditional pharmacy [49].

4.8.2. Telepharmacy market outlook

Research evaluates the market to reach USD 123.57 million by 2028, expanding at a CAGR of 6.19% during the forecast period mentioned above. The increasing awareness among patients regarding the advantages of telepharmacy will create profitable opportunities for market growth. The expanding access to quality healthcare services in medically underserved and rural regions, the rising number of internet connections alongside growing internet users , the increasing volume of patients afflicted with infectious diseases such as Covid-19, among others [50], along with heightened preferences for online health services to minimize exposure and the risk of infection, are significant factors expected to drive the expansion of the telepharmacy market over the anticipated period of 2021-2028. Conversely, the lack of pharmacists in hospitals, rural hospitals that cannot afford pharmacists, the prevalence of inadequately trained pharmacists, alongside the existence of supportive government initiatives promoting telemedicine and rising healthcare spending, will further create substantial opportunities that will contribute to the growth of the telepharmacy market in the specified projected timeframe[51]

5. CONCLUSION

In this article, we explained how a well-planned pharmacy store layout and its design affect customer comfort and fulfill present requirements and future reliability for customers. We also explained the types and requirements for a good layout. The article also outlines the regulations that apply to pharmacy layout compliance. Also provide information about the services and how to counsel the patient, as well as barriers to effective counseling and strategies to overcome communication barriers. And about over-the-counter medication and how to ensure medication adherence, also offer telepharmacy, mobile health tracking, and online consultation. A good drugstore is accessible, friendly, and patient-focused, often serving as the first point of contact for health concerns in the community.

6. Importance

A well-designed drugstore layout is vital for both operational efficiency and customer satisfaction. Enhanced customer experience and improved workflow promote confidential conversations and clinical services. Also provide smart, patient-friendly spaces that support better healthcare delivery and efficient business operations. Offer health education, wellness programs, and regular checkups to prevent chronic illness and help to ensure medication adherence and avoid drug contraindication.

Table 1 Pharmacy Store Temperature Zones

Zone	Temp. rang	Purpose / Example	Reference
Frozen	-25°C to -10°C	Used for vaccines like COVID-19 mRNA vaccines (Pfizer, Moderna), some biologics.	[10]
Refrigerated	2°C to 8°C	Insulin, vaccines (e.g., flu, hepatitis, MMR), certain antibiotics, eye drops.	
Cool	8°C to 15°C	Some liquid antibiotics, suppositories, select biologics.	[11]
Controlled Room Temperature	15°Cto 25°C	Most tablets, capsules, creams, and OTC medications.	[12]
Warm	30°C to 40°C	Not ideal for most medications; should be avoided.	
Excessive Heat	Above 40°C (104°F)	Can cause degradation of most drugs. Avoid storage in hot areas.	

Table 2: Essential Advanced Pharmacy Store Amenities Designed Specifically for Children

S.No.	B	C	D	Reference
1.	Child-Friendly Environment	Bright & Welcoming Design	Use colorful décor, or fun signage, or cartoon characters	[13]
		Kid-Sized Seating	A small waiting area with chairs and activities for kids only	
		Play Corner	Kids' meds: Educate parents on safe storage and child-proof packaging.	
2.	Kid-Safe Products & Services	Child-Proof Medication Section	Educate parents on safe storage and child-proof packaging.	
		Specialized Pediatric Medicines	Flavored syrups, chewable tablets and the easy to administer forms are available.	
		Allergy & Baby Care Items	Hypoallergenic skincare, baby food, and diapers are offered.	
3.	Education &	Pharmacist	Easy to understand guidance on	

	Awareness	Consultation	kids' medications provided.	
		□ Fun Health Tips	Posters or digital screens with tips on handwashing, dental care or vaccinations shared.	
		□ Medicine Flavoring Service	Liquid medications can be made tastier with flavors added by the pharmacist.	
4.	Engaging Promotions & Programs	□ Kids' Health Club	Vaccinations, dental check-ups, or vitamin purchases are rewarded.	
		□ Seasonal Events	Flu shot days with small giveaways, like stickers or balloons.	
		□ Loyalty Programs for Families	Parents can save money with discounts or special deals when buying their children's medicine.	
5.	Safety & Convenience	□ Easy Navigation	Clearly label baby care, pediatric medicines and first aid.	
		□ Drive-Thru or Delivery Service	Medicine home delivery for busy parents.	
		□ Emergency Essentials	First aid kits, fever reducers, teething gels are restocked.	

Table 3 Essential Pharmacy Facilities Designed Exclusively for Geriatric Patients

S.No.	**B**	**C**	**D**
1.	Senior-Friendly Environment	□ Comfortable Seating	Provide chairs with armrests in waiting areas.
		□ Clear Signage	Use large fonts and high-contrast colors for easy reading.
		□ Wide Aisles & Good Lighting	Ensure easy movement for those with mobility aids.
2.	Specialized Products & Services	□ Geriatric Medication Stock	Carry common medications for chronic conditions (diabetes, hypertension, arthritis, etc.).
		□ Pill Organizers & Dispensers	Offer weekly pill organizers and reminder tools.

		□ Home Healthcare Aids	Stock BP monitors, glucose meters, walkers, adult diapers, and orthopedic supports.
3.	Personalized Medication Management	□ Medication Review Services	Help seniors understand their prescriptions, potential side effects, and drug interactions.
		□ Automatic Refills & Reminders	Set up SMS or phone call reminders for prescription refills.
		□ Blister Packing Service	Offer pre-packaged daily doses to prevent confusion.
4.	Health Awareness & Community Engagement	□ Health Check-up Camps	Organize free BP, sugar level, or bone density checks.
		□ Educational Sessions	Provide workshops on medication adherence, fall prevention, and nutrition.
		□ Senior Discount Programs	Offer special discounts or loyalty programs for elderly customers.
5.	Safety & Convenience	□ Home Delivery Service	Offer free or low-cost delivery of medicines to senior citizens.
		□ Drive-Thru or Quick Pickup	Provide an easy pickup option for those with mobility challenges.
		□ Emergency Contacts & Support	Maintain a list of local emergency services or senior care centers

Table 4 Essential Pharmacy Store Facilities Designed Specifically for Expecting Mothers

S.No.	**B**	**C**	**D**
1.	Comfortable & Safe Environment	□ Seating Area	Provide comfortable chairs for pregnant women to rest while waiting.
		□ Priority Service	Offer a separate queue or fast-track service for expectant mothers.
		□ Non-Slip Flooring	Ensure floors are safe to prevent falls.
2.	Specialized Product Offerings	□ Prenatal Vitamins & Supplements	Stock essential supplements like folic acid, iron, and calcium.
		□ Maternity Care Products	Carry pregnancy pillows, maternity belts, stretch mark creams, and support

			stockings.
		□ Healthy Snacks & Drinks	Offer pregnancy-safe herbal teas, healthy snacks, and hydration drinks.
		□ Baby Care Essentials	Keep newborn essentials like diapers, baby wipes, and gentle skincare products.
3.	Expert Guidance & Consultation	□ Pharmacist Consultation	Provide guidance on safe medications during pregnancy.
		□ Medication Safety Check	Offer services to check if prescribed medicines are safe for pregnancy.
4.	Pregnancy & Wellness Services	□ Blood Pressure & Sugar Monitoring	Offer free or low-cost BP and glucose checks for expecting mothers.
		□ Weight Management Advice	Provide basic guidance on healthy pregnancy weight gain.
		□ Prenatal & Postnatal Workshops	Organize educational sessions on pregnancy nutrition, newborn care, and breastfeeding.

Table 5 Future of Indian pharmacies facilities

A	**B**	**C**	**D**
1.	Digital & Smart Pharmacy Solutions	□ E-Prescriptions & Teleconsultation	Collaboration with healthcare professionals for electronic prescriptions and online consultations.
		□ AI-Powered Medicine Recommendations	Intelligent systems that assess patient records for improved medication recommendations.
		□ Automated Dispensing Machines (ADM)	Rapid, mistake-free distribution of pharmaceuticals utilizing AI-driven devices.
		□ Pharmacy Mobile Apps	Applications for purchasing medications, monitoring prescriptions, and communicating with pharmacists.
2.	Advanced Medication Management	□ Personalized Medicine Packaging	Blister packaging with daily doses for elderly or chronic patients.
		□ AI-Based Drug Interaction Alerts	Systems that warn about harmful drug interactions before purchase.
		□ Automated Refill	SMS or app-based reminders for

		Reminders	prescription renewals.
3.	Expanded Healthcare Services	□ In-Pharmacy Diagnostics	Mini-clinics with blood sugar, cholesterol, BP, and thyroid testing.
		□ Vaccination Centers	Pharmacies becoming hubs for routine vaccinations like flu, hepatitis, and COVID-19.
		□ Chronic Disease Management	Dedicated programs for diabetes,hypertension, and heart health monitoring.
		□ Mental Health & Wellness Support	Offering stress management supplements and online counseling tie-ups.
4.	Sustainable & Eco-Friendly Pharmacy Practices	□ Eco-Friendly Packaging	Use of biodegradable or recyclable medicine packs.
		□ Medicine Waste Management	Proper disposal of expired or unused medicines to reduce environmental hazards.
		□ Energy-Efficient Stores	Solar-powered or energy-efficient pharmacies to cut down carbon footprint.
5.	AI & Robotics in Pharmacies	□ Robotic Prescription Filling	Automated robots sorting and dispensing medicines efficiently.
		□ AI Chatbots for Customer Queries:	24/7 virtual assistants helping customers with medicine information.
		□ Smart Inventory Management	AI-driven demand prediction to stock the right medicines at the right time.
6.	Home Delivery & Drone-Based Medicine Supply	□ Hyperlocal Medicine Delivery	Faster delivery via bike couriers for urgent medications.
		□ Drone-Based Delivery (Future Scope)	Especially useful in rural or emergency situations.
		□ Subscription-Based Medicine Supply	Monthly medicine delivery for chronic patients.
7.	Integration with Government & Health Schemes	□ Ayushman Bharat & Digital Health ID Integration	Seamless connection with government health programs.

		□ Jan Aushadhi Kendra Collaboration	More affordable generic medicines to benefit rural and urban populations.
		□ EHR (Electronic Health Records) Access	Pharmacies linking with hospitals to access patient history for better service.
8.	Smart Wellness & Lifestyle Products	□ DNA-Based Personalized Medicine	Future pharmacies might offer customized medicines based on genetic profiling.
		□ Wearable Health Tech Sales	Stocking smartwatches, BP monitors, glucose meters, and fitness trackers.
		□ Holistic Health Sections	Including Ayurveda, organic supplements, and alternative medicine options.
9.	Senior & Pregnancy Care Centers	□ Dedicated Geriatric & Maternity Sections	Special pharmacy sections for elderly and expecting mothers.
		□ Home Healthcare Products	Oxygen concentrators, adult diapers, walkers, and mobility aids.
		□ Nursing & Caregiver Services	Future pharmacies may offer home nursing care tie-ups.
10.	Phygital (Physical + Digital) Pharmacy Model	• Hybrid Model	A combination of offline stores and online pharmacy services for better customer convenience.
		• Virtual Pharmacy Assistants	AI-driven guides in stores to assist customers with medicine selection.
		• Subscription-Based Wellness Plans	Offering long-term health plans for frequent customers.

Future Prospects

- A well-designed drugstore layout is vital for both operational efficiency and customer satisfaction.
- Enhanced customer experience and improved workflow promote confidential conversations and clinical services.
- Provide smart, patient-friendly spaces that support better healthcare delivery and efficient business operations.

- Offer health education, wellness programs, and regular checkups to prevent chronic illness and help to ensure medication adherence and avoid drug contraindication.

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