Evolution of Over-the-Counter (OTC) Medications in Saudi Arabia

Salma Fahad Helal Alruwaili [1], Ahmad Hateem Omar Taha [2], Munayfah Lahiq Alanazi [3], Alharthi, Saud Abdulaziz Q [4], Ahmad Khalaf Muhil Alrwaili [5], Alfisal, Hamad Ali H [6], Alrowely, Madullah Ghazi M [7], Almari, Mohammed Khalaf M [8], Al Harthi Saad Waslallah E [9], Ishtiyaq Mohammed Awad Alsubhi [10]

1- Pharm D. Degree, King Abdulaziz Specialist Hospital in Al-Jouf, Saudi Arabia
2- Pharmacist, Medina Health Cluster, Saudi Arabia
3- Pharmacist, Maternity and Children's Hospital in Arar, Saudi Arabia
4- Pharmacist, Al-Bada General Hospital, Al-Bada, Saudi Arabia
5- Pharmacy Technician, Ministry of Health Branch- Northern Border Region, Saudi Arabia
6- Pharmacy Technician, Tumair General Hospital, Tumair, Saudi Arabia
7- Pharmacy Technician, King Abdulaziz Specialist Hospital, Al-Jouf, Saudi Arabia
8- Pharmacy Technician, King Abdulaziz Specialist Hospital, Al-Jouf, Saudi Arabia
9- Pharmacy, Taif Children's Hospital, Taif, Saudi Arabia
10- Pharmaceutical, King Salman Specialist Hospital, Hail, Saudi Arabia

Abstract:

The evolution of over-the-counter (OTC) medications in Saudi Arabia reflects broader trends in healthcare accessibility and regulatory changes. Over the past few decades, the government has worked to enhance pharmacy services and educate consumers about medication use. This shift has been characterized by increased availability of OTC options in pharmacies, which are now seen as essential for managing common health issues such as pain relief, cold symptoms, and gastrointestinal disorders. The Saudi Food and Drug Authority (SFDA) has played a crucial role in this evolution by implementing regulations that ensure the safety, efficacy, and quality of OTC products. As a result, consumers have become more empowered to make informed choices about their health, contributing to a shift in how medications are perceived and utilized. As the market for OTC medications has grown, there have been significant implications for public health and pharmaceutical companies. The rise of e-commerce has transformed access to these products, with online pharmacies becoming increasingly popular among consumers. Additionally, a younger, tech-savvy generation of Saudis is more open to self-medication and seeks fast solutions for minor ailments. This has led to an expansion of the range of OTC products available, including natural and herbal remedies, as well as international brands entering the market. The future of OTC medications in Saudi Arabia seems poised for continued growth, driven by consumer demand, evolving health trends, and ongoing regulatory support.

Keywords: OTC medications, Saudi Arabia, Healthcare accessibility, Pharmacy services, Saudi Food and Drug Authority (SFDA), Public health, E-commerce, Self-medication, Herbal remedies, Regulatory support.

Introduction:

The pharmaceutical landscape of any nation serves as a reflective mirror of its healthcare policies, market dynamics, and societal health needs. In Saudi Arabia, the evolution of Over-the-Counter (OTC) medications has charted a significant course over the past few decades, driven by various socio-economic, cultural, and regulatory factors. The transition from a predominantly regulated pharmacy environment to one that embraces self-medication through OTC drugs signifies a broader paradigm shift in public health management, healthcare accessibility, and consumer behavior within the Kingdom. Understanding this evolution is crucial for comprehending how Saudi Arabia's healthcare system responds to the growing demand for accessible medical care, particularly in light of its transitioning demographics and economic landscape [1].

Historically, Saudi Arabia's healthcare system has been dominated by state-funded healthcare services, particularly following the discovery of oil in the mid-20th century, which propelled economic growth and subsequently led to significant

improvements in public health infrastructure. However, as the population began to grow and diversify, the demand for healthcare services also increased, leading to the proliferation of various medication options, including OTC medications. These medications, which are available without a prescription, have been pivotal in enhancing patient autonomy and alleviating the burden on healthcare providers. They empower consumers to make health-related decisions and manage minor ailments independently, reflecting a growing trend towards self-care and wellness [2].

The regulatory environment surrounding OTC medications in Saudi Arabia has been marked by significant developments, particularly with the establishment of the Saudi Food and Drug Authority (SFDA) in 2003. The SFDA has played an instrumental role in the regulation, approval, and marketing of pharmaceuticals, including OTC drugs. Its mandate includes ensuring the safety, efficacy, and quality of medications available to the public. The introduction of more lenient regulations for OTC medications has led to an expansion of available products on the market, addressing both common ailments and chronic conditions. This evolution has also been accompanied by a strong emphasis on consumer education, with various health campaigns initiated by the SFDA to promote responsible self-medication and awareness of potential risks associated with improper use of OTC products [3].

Moreover, the demographic shifts within Saudi Arabia are changing the landscape of healthcare consumption. The population is increasingly younger, with the World Bank reporting that more than 50% of the population is below the age of 30. This demographic trend is accompanied by a growing awareness of health and wellness, fueled by increased access to information through the internet and social media. As a result, the younger generation is more inclined to seek out OTC medications for self-treatment of minor ailments, necessitating adaptations from healthcare policymakers and pharmaceutical companies alike. Consequently, the market for OTC medications has witnessed the emergence of innovative products tailored to specific consumer needs, fostering a competitive environment among pharmaceutical manufacturers [4].

Cultural perspectives also play a critical role in the evolution of OTC medications in Saudi Arabia. The interplay between traditional healing practices and modern medicine has given rise to a unique context within which OTC medications operate. Many Saudi citizens still value traditional remedies, which can affect their perceptions and usage of OTC products. This interface between cultural beliefs and pharmaceutical utilization presents both challenges and opportunities for healthcare promotion, requiring a nuanced understanding of consumer behavior and preferences [5]..

Lastly, the global context cannot be ignored when exploring the evolution of OTC medications in Saudi Arabia. The international pharmaceutical market's dynamics, influenced by innovations in drug development and changes in consumer behavior worldwide, impact the availability and marketing strategies of OTC medications within the Kingdom. The rise of e-commerce and online pharmacies has also introduced new avenues for consumers to access these products, fundamentally changing the traditional pathways of medication purchase [6].

Historical Overview of OTC Regulations and Policies:

The over-the-counter (OTC) market has long served as a fundamental component of the global financial ecosystem. These markets enable parties to negotiate terms directly, resulting in significant flexibility compared to centralized exchanges. However, the evolution of OTC regulations and policies reflects the ongoing need to address challenges related to market transparency, investor protection, and systemic risk [7].

The practice of trading assets without a formal exchange dates back centuries, with roots traceable to various forms of direct commerce. In the financial realm, the OTC market emerged more distinctly in the 19th century as the trading of securities gained momentum. Initially, these transactions took place informally, facilitated by brokers and dealers who operated independently of formal exchanges. The rise of telegraphy and other communication technologies in this period gradually enhanced the ability of market participants to engage in such trades [8].

In the United States, the National Quotation Bureau (NQB), established in 1900, played a critical role in organizing OTC trading by providing price quotations for securities not listed on major exchanges. This development was foundational in

shaping the OTC landscape, but it did not carry any regulatory oversight. With no formal frameworks, the market operated with significant opacity, which frequently gave rise to fraud and manipulation [8].

The stock market crash of 1929 and the ensuing Great Depression laid bare the vulnerabilities of unregulated financial markets. Consequently, the federal government took decisive action to promote market stability and investor protection. The Securities Act of 1933 and the Securities Exchange Act of 1934 marked critical junctures in U.S. financial regulation. The latter established the Securities and Exchange Commission (SEC), responsible for regulating securities markets, including regulating OTC trades [9].

Despite these advancements, the OTC market itself remained largely underregulated for several decades. The SEC primarily focused on exchange-traded securities. However, as new financial products emerged and investor demand for OTC derivatives grew, the need for more comprehensive regulatory measures became apparent [9].

Fast forward to the late 20th century, the deregulation movement of the 1980s and 1990s initiated significant changes in financial markets, including OTC. The Commodities Futures Trading Commission (CFTC) began overseeing certain OTC derivatives, particularly in the energy and commodities space. However, as transactions proliferated, issues of market integrity and risk management became apparent [10].

The 2008 financial crisis was a watershed moment that catalyzed fundamental reforms in OTC regulations. The crisis revealed significant weaknesses in the financial system, particularly concerning OTC derivatives like credit default swaps, which contributed to systemic risk. In response, the Dodd-Frank Wall Street Reform and Consumer Protection Act was enacted in 2010, introducing a comprehensive regulatory framework aimed at enhancing transparency and accountability in OTC markets [11].

The Dodd-Frank Act implemented several measures to regulate OTC derivatives comprehensively. One of its key provisions mandated that standardized derivatives be traded on regulated exchanges or swap execution facilities (SEFs), drastically increasing transparency in the market. Additionally, it introduced the requirement for many swaps to be cleared through central counterparties (CCPs), thereby mitigating counterparty risk [11].

Moreover, the act established comprehensive reporting requirements for OTC derivatives transactions to a central trade repository. This change was instrumental in providing regulators with better visibility into the market, enabling them to detect potential systemic risks more effectively.

The creation of the Volcker Rule was another significant aspect of the Dodd-Frank Act, aimed at curbing excessive risk-taking by banks. It restricted proprietary trading and limited banks' investments in hedge funds and private equity, ultimately impacting the types of OTC transactions banks could engage in [12].

As financial markets have become increasingly interconnected, regulating OTC markets also necessitated an international perspective. Regulatory bodies across countries began to recognize the need for collaboration to manage cross-border risks effectively. The Financial Stability Board (FSB) and the Basel Committee on Banking Supervision initiated efforts to harmonize regulations for OTC derivatives internationally, giving rise to the G20 commitments made in 2009. These commitments emphasized standardization, central clearing, and trade reporting for global OTC transactions [13].

As of 2023, the landscape of OTC regulations continues to evolve in response to emerging technologies and financial innovations, such as blockchain and digital currencies. Regulatory agencies are grappling with the need to balance innovation with adequate safeguards. While significant progress has been made, challenges remain [14].

Enforcement of existing regulations is crucial, particularly as technological advancements facilitate new trading practices that fall outside traditional frameworks. Emerging asset classes, including cryptocurrencies and decentralized finance (DeFi), pose unique challenges and call for adaptive regulatory approaches. Regulators must ensure that investor protection and systemic risk mitigation remain at the forefront while fostering an environment of innovation [15].

Market Dynamics: Growth and Trends in OTC Medication Usage:

The over-the-counter (OTC) medication market has witnessed significant transformation over the past decades, evolving in response to healthcare needs, consumer behavior, regulatory changes, and technological advancements. The convenience and accessibility of OTC medications have positioned them as a crucial component of healthcare, allowing individuals to self-manage common ailments without the need for a physician's prescription [16].

Historically, the OTC drug market has fluctuated in alignment with public health trends, economic conditions, and regulatory frameworks. The late 20th century marked a significant shift towards self-medication, driven by increased consumer awareness and a desire for more autonomy in managing health. The rise of health-consciousness among consumers, alongside extensive marketing from pharmaceutical companies, contributed to the burgeoning growth of the OTC sector [17].

According to recent market analyses, the global OTC medication market was valued at approximately USD 140 billion in 2021 and is projected to reach around USD 200 billion by 2026, growing at a compound annual growth rate (CAGR) of approximately 7.5%. This growth is driven by various factors, including an aging population, increasing incidence of chronic diseases, and the prevalence of self-medication practices, particularly in regions such as North America, Europe, and Asia-Pacific [18].

Factors Influencing OTC Medication Usage

Several key factors contribute to the rising popularity and usage of OTC medications:

1. Aging Population

The global population is aging rapidly, with individuals aged 65 and above expected to double by 2050. This demographic shift is resultant from increased life expectancy and lower birth rates. Older adults often experience a higher incidence of chronic conditions such as arthritis, diabetes, and hypertension, which can lead to an increase in the demand for OTC medications. Furthermore, this demographic is more inclined to manage minor health issues independently, thus driving the growth of the OTC market [19].

2. Self-Medication Trends

Self-medication, defined as the use of drugs to treat self-diagnosed ailments, has gained acceptance and popularity among consumers. Factors such as increased access to medical information through the internet, telemedicine, and innovative digital health platforms have empowered consumers to make informed decisions regarding their health. The COVID-19 pandemic has further accelerated this trend, as individuals sought convenient solutions for minor health issues to avoid crowded healthcare facilities [20].

3. Consumer Awareness and Education

Improved public health education initiatives have led to greater consumer awareness about health and wellness. As individuals become more informed about their health conditions and available treatment options, there is a growing acceptance of OTC medications as viable alternatives to prescription drugs. This awareness fosters a proactive approach to health management, encouraging individuals to utilize OTC medications for common ailments such as headaches, allergies, colds, and gastrointestinal disorders [20].

4. Regulatory Changes

The regulatory landscape around OTC medications has evolved, allowing for the reclassification of certain prescription drugs to OTC status. This transitions enable easier access to medications that can be safely managed by consumers without direct supervision from healthcare providers. Additionally, regulatory frameworks have become more favorable towards innovative OTC products, thereby facilitating growth in the market [21].

Emerging Trends in OTC Medication Usage

The OTC medication landscape is characterized by several notable trends that are shaping its future:

1. E-commerce and Digital Health Platforms

The rise of e-commerce has altered the way consumers access OTC medications. Online platforms now provide consumers with the ability to purchase medications conveniently from the comfort of their homes. This trend has been further amplified by the pandemic, which pushed many consumers to seek online solutions for their healthcare needs. Additionally, digital health platforms that offer telehealth consultations and prescription services are bridging the gap between online access and professional medical advice, thus enhancing the self-medication experience [22].

2. Personalization and Customization

As consumers increasingly seek tailored solutions for their health needs, the OTC market is witnessing a shift towards personalization. Companies are leveraging data analytics and artificial intelligence to develop customized medication plans based on individual health profiles, preferences, and lifestyles. This trend reflects a broader movement in healthcare towards consumer-centric approaches, where products and services are designed with the unique needs of individuals in mind [22].

3. Focus on Natural and Organic Products

There is a growing consumer preference for natural and organic OTC medications, driven by rising health consciousness and skepticism towards synthetic products. The demand for herbal remedies, dietary supplements, and other natural alternatives is expanding in response to consumer desires for gentler, non-invasive treatment options. Manufacturers are increasingly responding to this trend by formulating products that incorporate natural ingredients, thus catering to a segment of the market that prioritizes holistic wellness [23].

4. Sustainability and Ethical Considerations

Consumers are becoming more socially responsible and environmentally conscious, influencing the OTC medication market. Brands adopting sustainable practices in production, packaging, and distribution are likely to resonate with this eco-conscious segment. As a result, we anticipate increased transparency in sourcing, environmentally friendly packaging, and ethically produced ingredients within the OTC sector [23].

Role of the Saudi Food and Drug Authority (SFDA):

The Saudi Food and Drug Authority (SFDA) is an essential regulatory body in the Kingdom of Saudi Arabia that plays a pivotal role in ensuring the safety, effectiveness, and quality of food, drugs, medical devices, and other related products. Established in 2003, the SFDA operates under the Ministry of Health, and its primary aim is to safeguard public health and promote the well-being of the Saudi population through effective regulation, monitoring, and enforcement of the standards governing food and pharmaceuticals within the Kingdom [24].

The inception of the SFDA came against the backdrop of a growing recognition of the vital need for robust regulatory frameworks as the Saudi economy diversified and international trade in food and pharmaceuticals expanded. Before the establishment of the SFDA, food safety and drug regulation lacked a central authoritative body, which often led to inconsistencies in product quality and, at times, public health concerns. The establishment of the SFDA marked a turning point in addressing these issues, empowering the Kingdom to take an integrated approach to health and safety regulation [25].

Core Functions

The SFDA's core functions can be broadly categorized into five distinct areas:

1. **Regulatory Oversight**: The SFDA is responsible for the regulation and registration of food items, pharmaceuticals, and medical devices. This entails setting standards for product safety and quality, conducting inspections, and issuing licenses to vendors and manufacturers. The SFDA strives to establish a regulatory environment that fosters innovation while ensuring consumer safety [26].
2. **Food Safety**: In terms of food regulation, the SFDA implements various initiatives to monitor food production, processing, distribution, and consumption. This involves conducting inspections on food establishments, testing food products, and enforcing compliance with local and international food safety standards. The SFDA also works closely with local and international organizations to enhance food safety practices and respond effectively to food safety crises [27].
3. **Pharmaceutical Regulation**: The SFDA plays a crucial role in the evaluation and approval of new medications, monitoring their efficacy and safety before they are made available to the public. It reviews clinical trial data, evaluates the risk-benefit profiles of drugs, and ensures that all pharmaceutical products meet stringent quality standards. Additionally, the SFDA engages in post-marketing surveillance to monitor the performance of drugs in the market [28].

4. **Health Awareness and Education**: Understanding the need for public awareness, the SFDA proactively engages in educational campaigns that inform citizens about food safety practices, pharmaceutical use, and the importance of adhering to healthcare guidelines. By promoting health literacy, the SFDA seeks to empower consumers to make informed decisions regarding their diets and medical treatments [29].
5. **Research and Development**: The SFDA actively participates in research and development initiatives aimed at improving the food and drug sectors within Saudi Arabia. This involvement includes funding studies on food safety, drug interactions, and consumer behavior, and collaborating with academic institutions to enhance scientific knowledge and innovation in regulatory practices [30].

Recent Initiatives

In recent years, the SFDA has launched several progressive initiatives to improve its regulatory processes and enhance public health. One noteworthy endeavor is the implementation of advanced digital platforms for regulatory submissions and inspections, allowing for quicker and more efficient processing of applications. This move is part of the broader Vision 2030 initiative, which emphasizes the modernization of government services in Saudi Arabia [31].

Moreover, the SFDA has focused on enhancing collaboration with international regulatory bodies such as the World Health Organization (WHO) and the International Organization for Standardization (ISO). These collaborations facilitate knowledge sharing and enable Saudi Arabia to align its regulations with global best practices, ultimately benefiting public health outcomes [32].

Despite its significant advancements, the SFDA faces several challenges in fulfilling its mandate. Rapid technological advancements in food production and pharmaceuticals, along with globalization and increased importation of goods, necessitate constant adaptations in regulatory frameworks. Coupled with an increasing public demand for transparency and accountability, the SFDA must navigate these complexities while ensuring oversight and compliance [33].

To address these challenges, the SFDA is focusing on developing a more agile regulatory environment that can quickly adapt to new technologies and emerging health issues. This involves enhancing stakeholder engagement, including collaboration with the local food and pharmaceutical industries, academia, and healthcare professionals, to effectively address current trends and public health needs [34].

Additionally, the SFDA may benefit from investing further in capacity building and training for its workforce. By developing a highly skilled and knowledgeable regulatory team, the SFDA can ensure that it effectively meets the demands of a fast-paced and ever-evolving food and drug landscape [35].

Consumer Behavior and Attitudes Towards OTC Products:

In the contemporary landscape of healthcare, Over-the-Counter (OTC) products have emerged as a critical component of consumer health management. OTC products, which encompass a myriad of items ranging from analgesics and cold remedies to vitamins and dietary supplements, are readily accessible without prescription, allowing individuals to take charge of their healthcare decisions. Understanding consumer behavior and the attitudes towards these products is vital for marketers, healthcare professionals, and policymakers alike, as these factors influence purchasing decisions, health outcomes, and the broader implications for the healthcare system [36].

Consumer behavior refers to the actions and decision-making processes of individuals in acquiring goods and services. In the context of OTC products, consumer behavior can be influenced by several factors, including personal predispositions, environmental stimuli, social influences, and psychological needs. The initial stage in the consumer decision process typically begins with recognition of a need or desire for a product. For example, someone may experience a headache and subsequently seek an OTC analgesic. This recognition is often shaped by various factors, including marketing communications, cultural beliefs, and past experiences with similar products [37].

1. **Information Search and Evaluation:** Once a need is recognized, the consumer embarks on an information

search. This phase can involve gathering data from multiple sources, such as advertisements, healthcare professionals, family and friends, and online platforms. The advent of e-commerce and access to digital health resources have transformed how consumers research their options. Online reviews, social media, and informational websites enable consumers to compare products, seek recommendations, and assess the credibility of OTC options. The evaluation of alternatives culminates in a decision, driven by a combination of perceived efficacy, safety, price, and convenience [38].

2. **Influence of Brand Loyalty and Trust:** Brand loyalty is another critical component influencing consumer behavior towards OTC products. Many individuals develop brand preferences based on experiences or perceptions of quality and efficacy. When a consumer has a positive experience with a particular brand, they are more likely to repurchase that product in the future. Trust in the brand becomes paramount, particularly in the health sector, where the stakes are high. Brands that effectively communicate their safety and efficacy through transparent marketing practices can foster strong consumer loyalty [39].

3. **Social Influences and Cultural Norms:** Social influences play a pivotal role in shaping attitudes towards OTC products. Recommendations from peers and family, cultural norms regarding health and wellness, and exposure to advertising campaigns can significantly sway consumer behavior. For instance, in cultures where self-medication is prevalent, OTC products may be more readily accepted and utilized. Conversely, in contexts where professional medical advice is prioritized, consumers may exhibit greater hesitation to self-treat [40].

Consumer Attitudes Towards OTC Products

Consumer attitudes towards OTC products are multifaceted and influenced by a variety of factors, including perceived benefits, safety concerns, marketing efforts, and overall health literacy.

1. **Perceived Benefits and Efficacy:** One of the leading drivers of consumer attitudes is the perceived benefit derived from using OTC products. Consumers are often attracted to these products due to their perceived immediacy and convenience, as they offer a quick solution for minor health issues. The notion that certain OTC medications can provide fast relief or aid in symptom management appeals to a populace seeking efficiency, particularly in an age where time is of the essence [41].

2. **Safety and Regulatory Perceptions:** Despite the convenience associated with OTC products, concerns about safety and the potential for misuse can impact consumer attitudes. The American Journal of Public Health highlighted that while consumers appreciate fewer barriers to obtaining treatments, they can feel ambivalence about the self-diagnosis and self-treatment aspects of OTC utilization. The existence of misconceptions regarding dosage, adverse effects, and drug interactions can lead to hesitance among consumers. Trust in regulatory bodies, such as the Food and Drug Administration (FDA), also plays an essential role; consumers are more likely to embrace products that are well-regulated and backed by solid scientific evidence.

3. **Health Literacy and Empowerment:** Health literacy includes the ability to obtain, process, and understand health-related information. Higher health literacy empowers consumers to make informed decisions regarding OTC products, leading to more favorable attitudes. Conversely, a lack of health literacy can result in misinterpretation of product labels, instructions, and warnings, which can foster skepticism about OTC products. Programs aimed at improving health literacy can enhance consumer engagement with OTC products and promote responsible usage [41].

4. **Marketing and Communication Strategies:** The marketing strategies deployed by OTC manufacturers significantly shape consumer attitudes.

Engaging advertising campaigns that emphasize product benefits, share testimonials, and highlight safety information can bolster consumer perception and acceptance. Moreover, educational content that explains how to use OTC products safely and effectively can enhance trust and drive purchase behavior. However, it is crucial that marketing practices prioritize ethical considerations, ensuring that claims are substantiated and not misleading [41].

Impact of E-Commerce on OTC Medication Accessibility:

In recent years, the rise of e-commerce has transformed the landscape of retail across numerous sectors, reshaping consumer behavior and redefining market dynamics. One of the areas significantly affected by this digital shift is the accessibility of Over-the-Counter (OTC) medications. Traditionally, consumers relied on physical pharmacies for their medicinal needs; however, the advent of online shopping platforms has introduced new avenues for purchasing these essential products [42].

The most immediate benefit of e-commerce in relation to OTC medications is the unparalleled convenience it offers consumers. Traditionally, obtaining OTC medications required physical travel to a pharmacy or supermarket. This posed challenges, especially for individuals with mobility issues, those residing in rural areas with limited pharmacy access, or those with demanding schedules. E-commerce platforms have eliminated these barriers by enabling consumers to browse, compare, and purchase medications from the comfort of their own homes.

Websites and applications dedicated to pharmacy services offer user-friendly interfaces where individuals can quickly search for specific products or peruse categories based on their needs. For example, a consumer experiencing flu-like symptoms can conveniently search for cold and flu medications without the need to navigate crowded aisles or wait in long lines. Furthermore, many e-commerce platforms provide options for home delivery, ensuring that medications arrive directly at the customer's doorstep, which is particularly beneficial for those unable to travel [42].

Another significant impact of e-commerce is the enhanced availability of OTC medications. In traditional retail settings, inventory can be limited, and certain products may frequently be out of stock due to fluctuating demand. Online platforms, however, often have access to a broader range of products and can source medications from multiple distributors. This allows consumers to find specific products that may not be available in their local pharmacies.

E-commerce also enables retailers to maintain comprehensive inventories that can easily be updated in real-time. For instance, if a popular antihistamine is sold out in local stores, consumers can check various online platforms to find availability, potentially purchasing from retailers located far from their geographic area. This level of accessibility is particularly crucial for individuals with chronic health conditions requiring regular purchases of certain medications [43].

E-commerce has led to greater price transparency and competition in the OTC medication market, contributing to cost-effectiveness for consumers. Traditional brick-and-mortar pharmacies often have fixed pricing policies, whereas online platforms allow for comparison shopping. Users can easily find lower prices by shopping across several websites or utilizing price comparison tools. Additionally, many e-commerce retailers offer discounts, bulk purchasing options, and loyalty programs, incentivizing consumers to choose their platform for medication purchases [44].

Furthermore, the overhead costs associated with physical storefronts can be lower for online retailers, enabling them to pass those savings onto consumers. This potential for reduced costs can be particularly beneficial for low-income households who rely on OTC medications for everyday health needs [44].

E-commerce platforms frequently provide a wealth of information alongside product listings, empowering consumers to make informed decisions about their health. Detailed descriptions, usage instructions, ingredient lists, and potential side effects are typically available, allowing consumers to assess compatibility with their health conditions. Additionally, customer reviews and ratings can guide users in selecting effective products based on the experiences of others.

This access to comprehensive health information fosters greater consumer awareness and can lead to

more responsible medicine usage. Patients who educate themselves about OTC medications can better understand their conditions and treatment options, ultimately contributing to positive health outcomes [45].

Despite the numerous benefits that e-commerce brings to the accessibility of OTC medications, it is not without challenges and considerations. One of the primary concerns is the risk of purchasing counterfeit or substandard drugs. The unregulated nature of the internet makes it easier for fraudulent sellers to operate, posing significant risks to consumer safety. Therefore, it is imperative for consumers to purchase from reputable websites with established safety protocols [46].

Another concern relates to the potential for misuse of medications. The ease of purchasing OTC drugs online may lead to over-reliance on self-medication without sufficient consultation with healthcare professionals. For instance, consumers might bypass medical advice when treating symptoms and instead turn to online purchases for unmonitored access to various medications. While e-commerce facilitates accessibility, it is crucial to remember that not all health conditions can—or should—be self-treated without professional guidance [47].

Additionally, the issue of pharmacy deserts, which refer to areas with limited access to pharmacies, may worsen with the proliferation of online medication sales. While e-commerce provides an alternative for those living in pharmacy deserts, it should not replace the essential role that local pharmacies play in community health, especially when it comes to providing personalized advice and services such as medication management and consultations.

Challenges and Concerns in OTC Medication Management:

Over-the-counter (OTC) medications are widely accessible options for consumers seeking relief from common ailments such as headaches, colds, allergies, and minor aches. These medications, typically available without a prescription in pharmacies, supermarkets, and convenience stores, provide a sense of autonomy to individuals in managing their health. However, the convenience of OTC medications comes with a range of challenges and concerns that can lead to misuse, adverse effects, and complex medical interactions. An understanding of these challenges is crucial for both consumers and health professionals to ensure safe and effective medication use [48].

One of the primary challenges in OTC medication management is the general lack of awareness and education among consumers regarding these substances. Many people who purchase OTC medications do so with little understanding of the active ingredients and potential side effects. Unlike prescription medications, OTC products often do not come with personalized counseling from healthcare providers, leaving consumers to rely on packaging information and advertising to inform their choices [48].

This lack of education can lead to self-diagnosis and self-treatment that may be inappropriate or even harmful. For instance, a consumer may use multiple products containing the same active ingredient, unknowingly exceeding the recommended dosage. This practice is particularly common with pain relievers such as acetaminophen, which, in excessive amounts, can lead to liver damage. Therefore, enhancing consumer education through healthcare outreach initiatives and clear labeling on packaging is vital in mitigating risks associated with OTC medications [48].

OTC medications, while deemed safer than prescription medications, are not without risks, particularly concerning misuse and overuse. The ease of access to these medications can foster a false sense of security, leading consumers to underestimate their potential dangers. A significant concern is the misuse of products containing ingredients like pseudoephedrine, which is often found in cold and allergy medications. Pseudoephedrine can be utilized illicitly to manufacture methamphetamine, leading to legislative actions restricting its sale.

In addition, overuse of common OTC medications can result in serious health consequences. For example, frequent use of NSAIDs (non-steroidal anti-inflammatory drugs) for pain management can lead to gastrointestinal bleeding and kidney damage. The challenge lies in balancing accessibility with adequate regulations to minimize the risk of misuse. Pharmacists and healthcare providers play a crucial role in guiding appropriate use and monitoring consumption patterns among patients [49].

Different OTC medications can interact with each other or with prescription drugs, potentially leading to adverse reactions. For instance, combining

antihistamines with alcohol can result in heightened drowsiness, increasing the risk of accidents or injuries. Furthermore, consumers may not disclose their use of OTC products to their healthcare providers, either due to forgetfulness or underestimating the importance of this information [49].

Allergies and pre-existing health conditions can further complicate OTC medication management. Some consumers may have allergies to common ingredients found in OTC products, leading to unexpected and sometimes severe reactions. An example of this is the common pain reliever ibuprofen, which can cause an allergic reaction in certain individuals.

Healthcare providers must emphasize the importance of comprehensive health histories that include not only prescription medications but also OTC products and supplements. This comprehensive approach is essential in minimizing the risks associated with drug interactions and allergic reactions [50].

While OTC medications are generally considered safe, the regulatory environment surrounding their production and sale poses additional challenges. The U.S. Food and Drug Administration (FDA) regulates OTC medications, but the standards can vary significantly compared to prescription drugs. This regulatory loophole raises concerns about quality control, manufacturing practices, and efficacy [51].

The presence of counterfeit or substandard OTC medications is a growing global issue, facilitated by the rise of online pharmacies and informal sale channels. Consumers, eager for relief from symptoms, may turn to these dubious sources, unaware of the potential risks involved. Hence, regulatory bodies must continually adapt and strengthen their oversight of OTC medications to enhance consumer safety and confidence [52].

Cultural attitudes toward medication and healthcare can also impact the management of OTC medications. In certain cultures, there may be a preference for traditional remedies over pharmaceutical drugs, leading to a lack of engagement with OTC therapeutic options. Similarly, socioeconomic factors play a crucial role; individuals in lower-income brackets may prioritize cost over safety, opting for cheaper alternatives without fully understanding their potential risks [53].

Health disparities rooted in socioeconomic conditions can impact access to education regarding proper medication use, making it a burden for healthcare providers to reach all demographics effectively. Tailored approaches that consider cultural beliefs and socioeconomic barriers may increase engagement and safety in OTC medication management [54].

Future Directions and Opportunities in OTC Market Development:

Over-the-counter (OTC) markets have long played a crucial role in the global financial landscape, eliminating the limitations imposed by traditional stock exchanges. These decentralized platforms for trading various financial instruments, such as equities, commodities, currencies, and derivatives, facilitate significant liquidity while allowing for greater flexibility in transactions. As we navigate through the complexities of an increasingly digitalized world, understanding the future directions and opportunities in OTC market development becomes essential for market participants, regulators, and policymakers [55].

One of the most prominent influences on the evolution of OTC markets is technological innovation. The rise of fintech companies, blockchain technology, and artificial intelligence are transforming how OTC transactions are executed, recorded, and settled. The implementation of blockchain, in particular, holds the potential to enhance transparency and reduce counterparty risk through decentralized ledger technology (DLT). Smart contracts can further streamline processes by automating transaction protocols, which promotes efficiency and minimizes human error [56].

Moreover, artificial intelligence and machine learning can significantly elevate market analysis capabilities. By analyzing large datasets, AI can identify trading patterns, predict market trends, and enhance risk management strategies. As companies increasingly rely on data-driven decision-making, the ability to harness and analyze data will become paramount in OTC trading strategies, providing a competitive edge to those willing to innovate [57].

Another crucial aspect influencing the future of OTC markets is the evolving regulatory landscape. Following the 2008 financial crisis, regulators

worldwide turned a critical eye toward OTC derivatives, which were often seen as opaque and poorly managed. The implementation of stringent measures post-crisis aimed at increasing transparency, encouraging central clearing, and ensuring better risk management practices [58].

However, as the regulatory environment matures, regulators must strike a balance between minimizing systemic risk and fostering market innovation. One key regulatory challenge is the need to adapt to the rapidly evolving technologies underpinning OTC trading. For instance, the sheer speed and agility of cryptocurrency markets have left regulators scrambling to develop frameworks that promote stability without stifling innovation [59].

Furthermore, cross-border regulatory harmonization remains a concern; as OTC markets are inherently global, inconsistency between different jurisdictional regulations could lead to increased costs and complexity for market participants. Policymakers must work collaboratively to create a cohesive international framework that facilitates seamless OTC transactions across borders [60].

Another area ripe for development within OTC markets is the inclusion of diverse market participants. Historically, OTC trading has been dominated by institutional investors and high-net-worth individuals who possess the resources to navigate the complexities of these markets. However, the proliferation of fintech solutions now holds the promise of democratizing access to OTC trading [61].

Through innovative platforms that offer lower transaction costs and improved user experiences, retail investors have a more viable opportunity to engage with OTC assets than ever before. This inclusivity can not only lead to increased market liquidity but also foster robust price discovery mechanisms, ultimately contributing to overall market efficiency. As awareness about OTC trading grows, it will be essential for market players to educate investors on the intricacies and benefits of participating in these markets responsibly [62].

The growing emphasis on sustainability and responsible investing presents another significant opportunity for OTC market development. As global financial markets increasingly recognize the significance of environmental, social, and governance (ESG) factors, there is a compelling need for OTC markets to adapt and develop instruments that align with these values [63].

Green bonds, sustainability-linked derivatives, and ESG-focused funds are emerging as attractive options for investors seeking to align their portfolios with sustainable practices. OTC markets can facilitate the growth of such instruments, allowing companies to raise capital for environmentally sustainable projects while enabling investors to support socially responsible initiatives [64].

Implementing transparent reporting standards and performance metrics and utilizing technology to track and verify ESG compliance will be critical for building trust in these newly developed OTC financial products [65].

As international trade continues to flourish, globalization will inevitably impact OTC market development. The capacity to conduct transactions across borders without the constraints of centralized exchanges offers numerous advantages, including time zone flexibility and diversification of assets [66].

However, for OTC markets to fully capitalize on globalization, issues related to transparency, taxation, and reporting must be addressed. Establishing efficient systems that facilitate the cross-border flow of funds while adhering to various regulatory frameworks will foster an environment where OTC markets can thrive globally [67].

Additionally, education plays a pivotal role in increasing market accessibility. Market participants must be informed about the dynamics of international OTC trading and the various factors influencing prices across different regions. This knowledge will empower investors, institutions, and traders to make informed decisions while promoting healthy market competition [68].

Conclusion:

In conclusion, the evolution of over-the-counter (OTC) medications in Saudi Arabia signifies a transformative shift in healthcare access and consumer empowerment within the pharmaceutical landscape. The collaboration between regulatory bodies, such as the Saudi Food and Drug Authority (SFDA), and healthcare providers has established a framework that ensures the safety and efficacy of OTC products while promoting responsible self-medication practices. The increasing availability of a diverse range of OTC medications, supported by

technological advancements and changing consumer behaviors, reflects a growing acceptance of self-treatment for common ailments among the Saudi population.

As the market continues to evolve, key challenges such as public awareness, proper usage education, and the regulation of emerging products must be addressed to optimize the benefits of OTC medications. Looking ahead, there is significant potential for further growth in this sector, particularly with the rise of e-commerce and the increasing interest in health and wellness among consumers. By fostering an environment of informed decision-making and regulatory support, Saudi Arabia can enhance the overall health outcomes of its population through the effective utilization of OTC medications.

References:

1. Alhazmi M., Bajuayfir A., Cheema E., Elrggal M., Ali M. Evaluation of current community pharmacist practice in Saudi Arabia—A cross-sectional study from pharmacists' perspective (part II) Pharmacy. 2022;10:38. doi: 10.3390/pharmacy10020038.
2. AlGhofaili F. Patterns of self-medication in Qassim Province, Saudi Arabia: A cross-sectional study. Ann. Med. Surg. 2021;64:102207. doi: 10.1016/j.amsu.2021.102207.
3. Curry L.C., Walker C., Hogstel M.O., Burns P. Teaching older adults to self-manage medications: Preventing adverse drug reactions. J. Gerontol. Nurs. 2005;31:32–42. doi: 10.3928/0098-9134-20050401-09.
4. Mahzari Y.I., Aldhfyan Y.M., Aldossary A.M., Alghamdi E.A., Alsubaie M.L., Aldossari M.A. Self-medication in Saudi Arabia: A cross-sectional study. Indo Am. J. Pharm. Sci. 2019;6:2868–2876.
5. Frey E., Bonfiglioli C., Brunner M., Frawley J. Parents' use of social media as a health information source for their children: A scoping review. Acad. Pediatr. 2022;22:526–539. doi: 10.1016/j.acap.2021.12.006.
6. Albusalih F.A., Naqvi A.A., Ahmad R., Ahmad N. Prevalence of Self-medication among students of pharmacy and medicine colleges of a public sector university in Dammam City, Saudi Arabia. Pharmacy. 2017;5:51. doi: 10.3390/pharmacy5030051.
7. WHO Guideline for the Regulatory Assessment of Medicinal Products for Use in Self-Medication. 2000.
8. Abdullah I.S., Chaw L.L., Koh D., Hussain Z., Goh K.W., Abdul Hamid A.A., Ming L.C. Over-the-counter medicine attitudes and knowledge among university and college students in Brunei Darussalam: Findings from the First National Survey. Int. J. Environ. Res. Public Health. 2022;19:2658. doi: 10.3390/ijerph19052658.
9. Baines P. Family interests and medical decisions for children. Bioethics. 2017;31:599–607. doi: 10.1111/bioe.12376.
10. Hernandez-Juyol M., Job-Quesada J.R. Dentistry and self-medication: A current challenge. Med. Oral. 2002;7:344–347.
11. Sen Tunc E., Aksoy E., Arslan H.N., Kaya Z. Evaluation of parents' knowledge, attitudes, and practices regarding self-medication for their children's dental problems during the COVID-19 pandemic: A cross-sectional survey. BMC Oral Health. 2021;21:98. doi: 10.1186/s12903-021-01466-7.
12. Carrasco-Garrido P., Jiménez-García R., Barrera V.H., Gil de Miguel A. Predictive factors of self-medicated drug use among the Spanish adult population. Pharmacoepidemiol. Drug Saf. 2008;17:193–199. doi: 10.1002/pds.1455.
13. Orayj K., Alshahrani S.M., Alqahtani A.M., Alasmari N., Atef A.A.A., Jrais H.S., Muslot D. The use of over-the-counter (OTC) medications by university students during examinations in Saudi Arabia: A cross-sectional study. Risk Manag. Health Policy. 2021;14:2675–2682. doi: 10.2147/RMHP.S312559.
14. Alsuhaibani R., Alsuhaibani M. Self-medication among Saudi children by parents in Al-Qassim Region, Saudi Arabia. Majmaah J. Health Sci. 2020;8:53. doi: 10.5455/mjhs.2020.01.007.
15. Alonzo-Castro A.J., Ruiz-Noa Y., Martínez-de la Cruz G.C., Ramírez-Morales M.A., Deveze-Álvarez M.A., Escutia-Gutiérrez R., Carranza-Álvarez C., Domínguez F., Maldonado-Miranda J.J., Ruiz-Padilla A.J. Factors and practices associated with self-medicating children among Mexican parents. Pharmaceuticals. 2022;15:1078. doi: 10.3390/ph15091078.
16. Pawaskar M.D., Balkrishnan R. Switching from prescription to over-the-counter

medications: A consumer and managed care perspective. Manag. Care Interface. 2007;20:42–47.
17. AlGhofaili F. Patterns of self-medication in Qassim Province, Saudi Arabia: A cross-sectional study. Ann. Med. Surg. 2021;64:102207. doi: 10.1016/j.amsu.2021.102207.
18. Bennadi D. Self-medication: A current challenge. J. Basic Clin. Pharm. 2013;5:19–23. doi: 10.4103/0976-0105.128253.
19. Bahrin Dzulkharnain F.B.S., Shafqat N., Hermansyah A., Tan C.S., Koh D., Goh K.W., Ming L.C. Knowledge, attitude and practice towards the use of over-the-counter medicines: An online survey among Bruneian adults amid the COVID-19 pandemic. Sustainability. 2022;14:9033. doi: 10.3390/su14159033.
20. Self-medication and self-prescription. Lifshitz A, Arrieta O, Burgos R, et al. Gac Med Mex. 2020;156:600–602. doi: 10.24875/GMM.M21000456.
21. Self-medication practice and associated factors among adult household members in Meket district, Northeast Ethiopia, 2017. Kassie AD, Bifftu BB, Mekonnen HS. BMC Pharmacol Toxicol. 2018;19:15. doi: 10.1186/s40360-018-0205-6.
22. Public knowledge, attitudes, and practices regarding the use of over-the-counter (OTC) analgesics in Indonesia: a cross-sectional study. Sinuraya RK, Wulandari C, Amalia R, Puspitasari IM. Patient Prefer Adherence. 2023;17:2569–2578. doi: 10.2147/PPA.S426290.
23. High prevalence of self-medication practices among medical and pharmacy students: a study from Jordan. Alkhatatbeh MJ, Alefan Q, Alqudah MA. Int J Clin Pharmacol Ther. 2016;54:390–398. doi: 10.5414/CP202451.
24. Evaluation of the knowledge, practices, and attitudes of community pharmacists towards adverse effects of non-steroidal anti-inflammatory drugs (NSAIDs): a cross-sectional study. Barakat HE, Aziz CN, Abougalambou SS. J Pharm Policy Pract. 2023;16:132. doi: 10.1186/s40545-023-00641-1.
25. Knowledge, attitude, and practice on over-the-counter drugs among pharmacy and medical students: a facility-based cross-sectional study. Bekele KM, Abay AM, Mengistu KA, Atsbeha BW, Demeke CA, Belay WS, Yimenu DK. Integr Pharm Res Pract. 2020;9:135–146. doi: 10.2147/IPRP.S266786.
26. Knowledge, attitudes and practices on medication use and safety among Saudi people: a public-based versus an internet-based survey in Taif; Kingdom of Saudi Arabia. Elbur A, Almalki NH, Alghamdi AA. Saudi J Med Pharm Sci. 2016;2:134–140.
27. Self-medication practice and factors influencing it among medical and paramedical students in India: a two-period comparative cross-sectional study. Kumar R, Goyal A, Padhy BM, Gupta YK. J Nat Sci Biol Med. 2016;7:143–148. doi: 10.4103/0976-9668.184700.
28. Comparison of knowledge, attitude, practice and predictors of self-medication with antibiotics among medical and non-medical students in Tanzania. Shitindi L, Issa O, Poyongo BP, Horumpende PG, Kagashe GA, Sangeda RZ. Front Pharmacol. 2023;14:1301561. doi: 10.3389/fphar.2023.1301561.
29. Frequency and knowledge of analgesics self-use and their adverse effects in the Eastern Province of Saudi Arabia. Almohammed BA. Cureus. 2023;15:0. doi: 10.7759/cureus.33344.
30. Current self-medication practices in the Kingdom of Saudi Arabia: an observational study. Al-Ghamdi S, Alfauri TM, Alharbi MA, et al. Pan Afr Med J. 2020;37:51. doi: 10.11604/pamj.2020.37.51.24098.
31. Drug-drug interactions with over-the-counter medicines: mind the unprescribed. Scherf-Clavel O. Ther Drug Monit. 2022;44:253–274. doi: 10.1097/FTD.0000000000000924.
32. Public's views on making decisions about over-the-counter medication and their attitudes towards evidence of effectiveness: a cross-sectional questionnaire study. Hanna LA, Hughes CM. Patient Educ Couns. 2011;83:345–351. doi: 10.1016/j.pec.2011.02.016.
33. Self-medication with over the counter drugs, prevalence of risky practice and its associated factors in pharmacy outlets of Asmara, Eritrea. Tesfamariam S, Anand IS, Kaleab G, Berhane S, Woldai B, Habte E, Russom M. BMC Public Health. 2019;19:159. doi: 10.1186/s12889-019-6470-5.
34. Overview: global and local impact of antibiotic resistance. Watkins RR, Bonomo RA. Infect Dis Clin North Am.

2016;30:313–322. doi: 10.1016/j.idc.2016.02.001.
35. Self-medication among pregnant women in Ghana: a systematic review and meta-analysis. Opoku R, Yar DD, Botchwey CO. Heliyon. 2022;8:0. doi: 10.1016/j.heliyon.2022.e10777.
36. Aljadhey H, Assiri GA, Mahmoud MA, al-Aqeel S, Murray M. Self-medication in Central Saudi Arabia: community pharmacy consumers' perspectives. Saudi Med J. (2015) 36:328–34. doi: 10.15537/smj.2015.3.10523.
37. El-Gamal F, Alsahafi BA, Alsammak I, et al. Knowledge, attitude, and practice towards over-the-counter drugs (OTC) use among adult population in Jeddah, Saudi Arabia. Middle East J Fam Med. (2022) 20. doi: 10.5742/mewfm.2022.9525056.
38. Dabbagh R, Aldofyan M, Alzaid W, Alsulimani A, Alshamrani S, Alqahtani S, et al. Prescription and over-the-counter drug misuse among female students at a Saudi university. J Subst Abus. (2021) 26:549–57. doi: 10.1080/14659891.2020.1856210.
39. Corrêa da Silva MG, Soares MC, Muccillo-Baisch AL. Self-medication in university students from the city of Rio Grande, Brazil. BMC Public Health. (2012) 12:1–7. doi: 10.1186/1471-2458-12-339.
40. Sansgiry SS, Bhansali AH, Bapat SS, Xu Q. Abuse of over-the-counter medicines: a pharmacist's perspective. Integ Pharm Res Pract. (2016) 6:1–6. doi: 10.2147/iprp.s103494.
41. Ayele AA, Mekuria AB, Tegegn HG, Gebresillassie BM, Mekonnen AB, Erku DA. Management of minor ailments in a community pharmacy setting: findings from simulated visits and qualitative study in Gondar town, Ethiopia. PloS One. (2018) 13:e0190583. doi: 10.1371/journal.pone.0190583.
42. Bekele KM, Abay AM, Mengistu KA, Atsbeha BW, Demeke CA, Belay WS, et al. Knowledge, attitude, and practice on over-the-counter drugs among pharmacy and medical students: a facility-based cross-sectional study. Integ Pharm Res Pract. (2020) 9:135–46. doi: 10.2147/iprp.s266786.
43. French DP, James DH. Reasons for the use of mild analgesics among English students. Pharm World Sci. (2008) 30:79–85. doi: 10.1007/s11096-007-9146-7.
44. Wertheimer AI, Serradell J. A discussion paper on self-care and its implications for pharmacists. Pharm World Sci. (2008) 30:309–15. doi: 10.1007/s11096-007-9187-y.
45. Almalak H, Alkhelb DA, Alsaleh HM, et al. Students' attitude toward use of over-the-counter medicines during exams in Saudi Arabia. Saudi Pharm J. (2014) 22:107–12. doi: 10.1016/j.jsps.2013.02.004.
46. Mok CZ, Sellappans R, Ee Loo JS. The prevalence and perception of self-medication among adults in the Klang Valley. Malay. Int J Pharm Pract. (2021) 29:29–36. doi: 10.1111/ijpp.12660.
47. Tesfamariam S, Anand IS, Kaleab G, Berhane S, Woldai B, Habte E, et al. Self-medication with over-the-counter drugs, prevalence of risky practice and its associated factors in pharmacy outlets of Asmara. Eritrea BMC Public Health. (2019) 19:1–9. doi: 10.1186/s12889-019-6470-5.
48. Gupta S, Chakraborty A. Pattern and practice of self-medication among adults in an urban community of West Bengal. J Family Med Prim Care. (2022) 11:1858–62. doi: 10.4103/jfmpc.jfmpc_1823_20.
49. Zamir Q, Nadeem A. Non-steroidal anti-inflammatory drugs vs. Paracetamol: drug availability, patients' preference and knowledge of toxicity. J Ayub Med College Abbottabad. (2016) 28:746–9.
50. Abraham O, Chmielinski J. Adolescents' misuse of over-the-counter medications: the need for pharmacist-led intervention. Innov Pharm. (2018) 9. doi: 10.24926/iip.v9i3.979.
51. Lehnbom EC, Berbakov ME, Hoffins EL, Moon J, Welch L, Chui MA. Elevating safe use of over-the-counter medications in older adults: a narrative review of pharmacy involved interventions and recommendations for improvement. Drugs Aging. (2023) 40:621–32. doi: 10.1007/s40266-023-01041-5.
52. Bennadi D. Self-medication: a current challenge. J Basic Clin Pharm. (2014) 5:19. doi: 10.4103/0976-0105.128253.
53. Cooper RJ. I can't be an addict. I am.' over-the-counter medicine abuse: a qualitative study. BMJ Open. (2013) 3:e002913. doi: 10.1136/bmjopen-2013-002913.
54. Nydert P., Kimland E., Kull I., Lindemalm S. Over-the-counter drug use—Estimations within the Swedish paediatric population.

Eur. J. Pediatr. 2011;170:583–588. doi: 10.1007/s00431-010-1321-5.
55. Lersch P.M., Struffolino E., Vitali A. Wealth in couples: Introduction to the special issue. Eur. J. Popul. 2022;38:623–641. doi: 10.1007/s10680-022-09640-5.
56. Mukattash T.L., Alghzawi N.Y., Abu Farha R.K., Jarab A.S., Hämeen-Anttila K., Vainio K., Gammoh O.S. An audit on parental attitudes towards medicines used in children. Saudi Pharm. J. 2018;26:133–137. doi: 10.1016/j.jsps.2017.10.001.
57. Siponen S., Ahonen R., Kiviniemi V., Hämeen-Anttila K. Association between parental attitudes and self-medication of their children. Int. J. Clin. Pharm. 2013;35:113–120. doi: 10.1007/s11096-012-9715-2.
58. Friedrichsdorf S.J., Goubert L. Pediatric pain treatment and prevention for hospitalized children. Pain Rep. 2020;5:e804. doi: 10.1097/PR9.0000000000000804.
59. Gupta S., McColl M.A., Guilcher S.J.T., Smith K. Managing medication cost burden: A qualitative study exploring experiences of people with disabilities in Canada. Int. J. Environ. Res. Public Health. 2019;16:3066. doi: 10.3390/ijerph16173066.
60. Aloudah N., Alhumsi A., Alobeid N., Aboheimed N., Aboheimed H., Aboheimed G. Factors impeding the supply of over-the-counter medications according to evidence-based practice: A mixed-methods study. PLoS ONE. 2020;15:e0240913. doi: 10.1371/journal.pone.0240913.
61. Almaghaslah D., Alsayari A., Asiri R., Albugami N. Pharmacy workforce in Saudi Arabia: Challenges and opportunities: A cross-sectional study. Int. J. Health Plan. Manag. 2019;34:e583–e593. doi: 10.1002/hpm.2674.
62. Green M.A., Little E., Cooper R., Relton C., Strong M. Investigation of social, demographic and health variations in the usage of prescribed and over-the-counter medicines within a large cohort (South Yorkshire, UK). BMJ Open. 2016;6:e012038. doi: 10.1136/bmjopen-2016-012038.
63. Chang J., Wang Q., Fang Y. Socioeconomic differences in self-medication among middle-aged and older people: Data from the China health and retirement longitudinal study. BMJ Open. 2017;7:e017306. doi: 10.1136/bmjopen-2017-017306.
64. Daban F., Pasarín M.I., Rodríguez-Sanz M., García-Altés A., Villalbí J.R., Zara C., Borrell C. Social determinants of prescribed and non-prescribed medicine use. Int. J. Equity Health. 2010;9:12. doi: 10.1186/1475-9276-9-12.
65. Mayer S., Österle A. Socioeconomic determinants of prescribed and non-prescribed medicine consumption in Austria. Eur. J. Public Health. 2015;25:597–603. doi: 10.1093/eurpub/cku179.
66. Lokker N., Sanders L., Perrin E.M., Kumar D., Finkle J., Franco V., Choi L., Johnston P.E., Rothman R.L. Parental misinterpretations of over-the-counter pediatric cough and cold medication labels. Pediatrics. 2009;123:1464–1471. doi: 10.1542/peds.2008-0854.
67. Nielsen M.W., Hansen E.H., Rasmussen N.K. Prescription and non-prescription medicine use in Denmark: Association with socio-economic position. Eur. J. Clin. Pharmacol. 2003;59:677–684. doi: 10.1007/s00228-003-0678-z.
68. Purssell E. Treatment of fever and over-the-counter medicines. Arch. Dis. Child. 2007;92:900–901. doi: 10.1136/adc.2007.118810.