

# *Research on Consumer Satisfaction in Pharmaceutical E-commerce based on Review Texts*

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**Abstract:** With the rapid development of e-commerce, the traditional pharmaceutical industry has also ushered in new opportunities and challenges. China's pharmaceutical e-commerce is in a phase of rapid development and reshuffling. The entry of Internet giants such as Ali JinDong and the e-commerce channelization of traditional pharmaceutical companies have both made pharmaceutical e-commerce explode with powerful vitality, showing tremendous growth as an important result of technology-enabled industrial upgrading. As more and more consumers choose to shop for medicines through pharmaceutical e-commerce platforms, online reviews as feedback on user satisfaction can provide a more valuable research basis for platform development and optimization. Based on the development of pharmaceutical e-commerce, this paper takes Ali Health Pharmacy, a giant platform of pharmaceutical e-commerce, as an example, and analyzes the factors affecting consumer satisfaction by mining the text of its online reviews, and summarizes and proposes suggestions for optimization from the perspectives of drug quality, logistics, service and how to give full play to the advantages of e-commerce.

## **1. Introduction**

With the implementation of national policies such as “Internet plus Health”, the development of pharmaceutical e-commerce as an important downstream link of China's Internet healthcare is gradually becoming a focus of the e-commerce industry. The B2C mode of pharmaceutical e-commerce shows a broader prospect than the B2B mode, and the analysis of user satisfaction on pharmaceutical e-commerce platforms can also help to better construct new consumption scenarios and experiences for consumers to purchase medicines online. As one of the largest pharmaceutical e-commerce platforms in China with the largest number of users and the widest variety of products, Ali Health Pharmacy's user reviews and consumer experience feedback have certain reference and research value. Therefore, this paper combines the development background of pharmaceutical e-commerce in the post-epidemic era with the text data of online reviews of pharmaceutical products from Ali Health Pharmacy to conduct a study and put forward corresponding suggestions for improving consumer satisfaction in pharmaceutical e-commerce.

## 2. Research Background

### 2.1 The State of Pharmaceutical e-Commerce

In the policy favorable and the rapid development of Internet technology and other factors, pharmaceutical Internet continues to promote, the rapid development of the pharmaceutical e-commerce industry, the market size is also growing at a rapid pace. According to Ai Media Consulting data show: by 2020 China's pharmaceutical e-commerce annual transaction scale has reached 23.4 billion pounds, year-on-year growth will be as high as 28%; at the same time, the pharmaceutical e-commerce penetration rate is steadily increasing, the market penetration rate in 2020 reached 7.4% much higher than the 4.8% in 2019. And with the opening and advancement of the policy, the pharmaceutical e-commerce industry under the influence of the epidemic will also usher in a new round of growth, which is expected to reach 27.7 billion pounds in 2021 overall will also maintain a continuous expansion trend.

On the other hand, the absolute value of the incremental volume of pharmaceutical retailing online in 2020 is 2.4 times that of offline. And as consumer habits change, there will be more and more pharmaceutical retailing will be focused on online sales, which also shows that there is still more potential room for pharmaceutical e-commerce to grow.

### 2.2 The Mode of Pharmaceutical e-Commerce Platform

At present, China's pharmaceutical e-commerce many, with the development of pharmaceutical e-commerce into the reshuffle period, the industry pattern is also gradually taking shape, participating in the pharmaceutical e-commerce enterprises in addition to explore the circulation field market, each pharmaceutical e-commerce enterprises also began in the user service experience and other links to try to extend.

#### 2.2.1 B2b Mode

B2B mode as the main marketing mode of China's pharmaceutical e-commerce, B2B pharmaceutical e-commerce business sales accounted for 56.4% of total pharmaceutical e-commerce sales in the same year in 2020. In recent years, pharmaceutical B2B has entered a phase of accelerated growth, showing a continuous increase in the volume of transactions, diversification of participating subjects, and business modes to show the characteristics of differentiation. Among them, self-operated B2B platforms have attracted more customers from the terminal by virtue of the dual advantages of products and prices, and have also become the mainstream choice of enterprises.

#### 2.2.2 B2c Mode

Although the B2C mode does not account for a large share of the market in terms of market share. However, due to its direct consumer orientation, the B2C mode has become the most active and mature market in pharmaceutical e-commerce. At the same time, the B2C mode has a richer and more balanced sales category structure than the B2B mode, with western medicine, other categories and medical equipment accounting for an equal share. At present, Ali Pharmacy of Taobao, Tmall Pharmacy and Jindong Pharmacy are the three giants in the B2C pharmaceutical e-commerce platform by virtue of their own advantages.

#### 2.2.3 O2o Mode

At this stage, the O2O mode of pharmaceutical e-commerce in China mainly refers to the way in

which consumers place orders online and retail terminals arrange delivery. On the whole, the scale of the O2O mode is still relatively small, and consumer orders are also characterized as “small and scattered”, more as an extension of the offline pharmacy service mode, with the gradual development of user habits and the formation of new consumption scenarios can still bring greater market space.

### 2.3 Challenges of Pharmaceutical e-Commerce

Unlike traditional offline pharmacies and hospital visits, purchasing medication directly online involves less direct face-to-face communication and consultation with a doctor. Consumers who lack relevant healthcare knowledge and middle-aged and elderly people have a strong distrust of internet applications and online physicians and platforms. At the same time, the lack of feedback and communication channels makes it difficult to make timely adjustments to users' actual medication use and there are certain limitations, which also reduces users' acceptance of pharmaceutical e-commerce platforms.

The quality of medicines is an unavoidable problem for pharmaceutical e-commerce platforms. Consumers who purchase medicines through pharmaceutical e-commerce platforms are mostly individuals who purchase medicines on their own, and without the diagnosis of a doctor and the guidance of a pharmacist, there is a risk of drug abuse and indiscriminate use, which can lead to irreversible consequences in serious cases. In addition, pharmaceutical e-commerce platforms adopt general logistics for distribution, and the distribution system is not qualified to obtain the quality management standard for pharmaceuticals, which makes it difficult to ensure the quality of drugs during the distribution process, especially for some drugs that require cold chain transportation or have special requirements for storage.

Today, the interface between China's health insurance system and pharmaceutical e-commerce platforms is only a “pilot”. Due to the high level of health insurance coverage in China at this stage, most of our residents are able to enjoy the convenience and benefits of our health insurance system when buying medicines. Therefore, even if users are more receptive to purchasing medicines online, the lower online payment coverage of health insurance does hinder the speed of online drug distribution.

## 3. Research Methodology and Research Process

### 3.1 Research Object

There are many pharmaceutical e-commerce platforms in China, including Ali Health Pharmacy and Jindong Pharmacy in the B2C mode, and Dingdong Fast Medicine and Quick Square in the O2O mode. Among them, Ali Health relies on Taobao Tmall to gain considerable capital, logistics and distribution support. As the platform with the highest usage rate of Chinese pharmaceutical e-commerce users in the first half of 2021, Ali Health's usage rate was 46.8%. Ali Health Pharmacy also has a wide consumer base, a wide range of pharmaceutical products and a relatively complete rating system. Therefore, the online review texts of four different categories of health products sold by Ali Health Pharmacy were chosen as the subject of this study.

*Table 1. Commodity Selections*

<i>Order</i>	<i>Product categories</i>	<i>Product name</i>
A	Commonly used medicines	999 GanMaoLing cold medicine
B	Traditional Chinese medicine	JiuZhiTang Bolus of Six Drugs Including Rehmannia
C	Nutritional care	Schiff Move Free Chondroitin Glucosamine
D	Medical equipment	Bayer Home Blood Glucose Test Strips

### 3.2 Research Methodology

In this paper, we chose the Python language and ROSTCM6 tool as the tools for text analysis, and crawled the review text data of four types of products with high sales volume and rich user reviews through python language according to the order of displaying web reviews. After the initial cleaning process such as de-duplication and deletion of deactivated words, the review text was word-separated using the jieba library, and the data was imported into ROSTCM6 for TF/IDF batch word frequency analysis and visualization.

### 3.3 Results of Text Analysis

A total of 1235 valid comment samples were obtained for this analysis. After data cleaning and pre-processing, the high frequency word list was obtained by word frequency analysis by ROSTCM through jieba splitting.

Table 2. Commodity Selections

Order	High-frequency Vocabulary
A	Good, delivery, genuine, logistics, fast, always available, satisfied, convenient, packaging, quality
B	Effective, good, satisfied, packaging, genuine, logistics, affordable, quality, delivery, expectation
C	Effect, knee, packaging, logistics, elderly, quality, relief, effective, repurchase, genuine
D	Cheap, good, convenient, quality, repurchase, delivery, alcohol, trash, promotions, logistics

The statistical results of the sentiment distribution of the four categories are as follows.

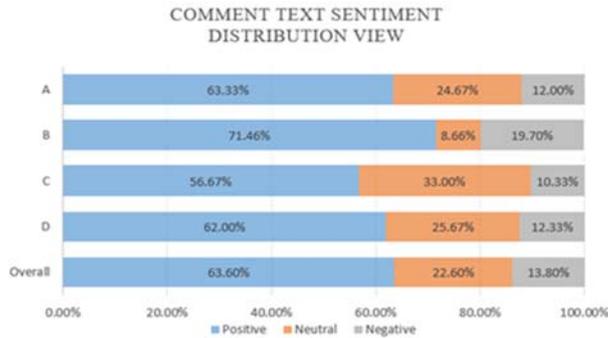


Fig.1 Comment Text Sentiment Distribution View

Based on the TD/IDF batch word frequency analysis, the high eigenvalue words are listed below.

Ranking	Words	Ranking	Words	Ranking	Words
1	Effects	11	Soon	21	Promotions
2	Not bad	12	Events	22	Express
3	Purchase	13	Shipping	23	worthwhile
4	Good	14	Cheap	24	Elderly
5	Packaging	15	Convenient	25	Pill
6	Logistics	16	Satisfaction	26	Merchants
7	Price	17	Hope	27	Many
8	Quality	18	Repurchase	28	Services
9	Genuine	19	Products	29	Effective
10	Well	20	Time	30	Recommend

Fig.2 Top 30 Text Feature Words by Td-Idf Value

### 3.4 Discussion

The high-frequency words in the reviews often provide a certain degree of insight into consumers' concerns about the medicines they buy, and are of some reference value in identifying the key factors that influence consumers' consumer experience and satisfaction. In terms of high-frequency words, consumers mainly focus on the words “delivery”, “logistics” and “packaging” in relation to logistics, and “genuine”, “effectiveness” in relation to the quality of medicines. This shows that consumers are concerned about the quality, price and logistics of medicines. Additionally, words such as “repurchase” and “always on hand” show that consumers are sticky in their purchasing behaviour, and that they mainly buy medicines in reserve for non-urgent use.

According to the results of the sentiment analysis, it can be seen that overall consumer sentiment is focused on positive and neutral sentiment, with little negative sentiment. It can be seen that users are satisfied with most of their consumer experiences, mainly in terms of fast logistics and delivery, good quality and genuine products. As for the negative sentiment, it is mainly focused on issues such as poor packaging, merchant services and logistics links. It can be seen that for consumers, the logistics packaging and delivery and the quality of drugs greatly affect the satisfaction of consumers, while consumers are very sensitive to the merchant service, the quality of the online service has a greater impact on consumer sentiment.

In terms of the different drug categories, consumers who buy commonly used drugs are more concerned with logistics and convenience, as they are more familiar with the functions and effects of these drugs and therefore less concerned with product quality. In contrast, most of the consumers who buy nourishing and health care medicines are first-time buyers and are more concerned with the effectiveness of the products and the brand of the products they buy. Therefore, it is important for pharmaceutical e-commerce companies to ensure that the purchasing experience is tailored to the needs of different consumers in order to improve consumer satisfaction.

## 4. Recommendations

### 4.1 Logistics

The logistics packaging usually determines the first impression of the consumer's judgement of the product. Due to its unique nature, pharmaceutical products have high requirements for storage and transportation, and distribution is required to ensure the quality of medicines according to their properties and temperature and humidity requirements. Therefore, the pharmaceutical e-commerce needs to ensure the integrity of the goods from the packaging, and at the same time improve the information technology and intelligent logistics system in the distribution link, so as to achieve effective monitoring of the transportation of drugs and provide better logistics services, thus bringing a better shopping experience.

### 4.2 Quality of Medicines

Both medicines and health products are closely related to the health of consumers. The quality and effectiveness of medicines not only affect customer satisfaction, but are also directly linked to consumers' personal safety. Platforms must take a global view and pay close attention to the quality of medicines, starting with the selection and monitoring of suppliers in the procurement process. In addition, research has also found that consumers prefer to shop for genuine and branded medicines, so the introduction of certified or established products will be more attractive to customers, and will also protect consumers' psychological expectations and thus increase customer satisfaction.

### 4.3 Customer Service

Pre-sales consultation and post-sales feedback services on pharmaceutical e-commerce platforms have always been one of the main concerns of consumers, and are an important means of improving customer satisfaction. With the gradual improvement of the closed loop of medical services online, consumers will be more and more inclined to shop and consult online. By improving the professionalism and service capability of online customer service, responding to consumers' queries in a timely manner, and actively communicating and following up on existing problems, the service system will be improved to enhance customer trust and stickiness.

### 4.4 Customer Needs

Unlike offline medical purchases for emergency use, most of the medicines purchased by consumers through pharmaceutical e-commerce are standby medicines such as cold and flu medicines or medicines for chronic diseases. The reduced need for timeliness also increases consumers' sensitivity to factors such as price and quality. Therefore, it is important to make full use of the digitalisation and scale of the e-commerce platform to realise the bargaining advantages of e-commerce by price and the technological advantages of the Internet in terms of service, to enrich the product categories and the shopping experience of different consumers, and to actively meet the health needs of consumers in order to enhance consumer satisfaction.

## 5. Conclusion

As a product of the Internet, with the formation of consumers' shopping habits on the Internet in the post-epidemic era, the online purchase of medicines has gradually entered people's lives. This paper first introduces the background and development environment of the current pharmaceutical e-commerce, and then collects and analyses the online review texts of four types of products on sale in Ali Health Pharmacy, including common medicines and health supplements, through python and ROSTCM tools. Based on the results, it was found that optimising the logistics chain, ensuring product quality, improving the service system and realising health needs could better improve the shopping experience of consumers, thus enhancing consumer satisfaction.

The following are the limitations of this study. The paper only chose the online review text of Ali Health Pharmacy as the research object, which inevitably lacks comparative analysis and leads to a lack of comprehensiveness of the conclusions and due to the existence of rebate for good review or the default rating of the system, the online review text is still less persuasive and authentic than the offline customer's opinion.

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