Interaction Design of Community Sharing Oxygen Supply Device

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Abstract. The purposes are to solve the problem of hypoxia in people with sudden illness, the demand for oxygen devices for people with sudden illness, respiratory diseases, pregnant women and other people, and to improve the quality of life. Taking the community as the research object, the user's oxygen device demand is analyzed and investigated; an oxygen cylinder rental sharing device is placed in the community, and a community sharing oxygen supply device intelligent service system is designed. This intelligent service system can provide oxygen equipment at any time. At the same time, in the case of sudden illness, people can take oxygen cylinders in the shortest distance and the shortest time, take oxygen rescue measures for patients at home, and reduce waste of resources. The service system designed to meet user's needs and experience must fully consider the oxygen supply requirements of the user group in the living environment, so as to design a service system that meets the user's needs.

Introduction

With the aging of the population in China and the declining air quality, the disease outbreaks of the elderly and chronically ill patients are becoming more and more frequent, which requires the rapid rescue of the affected population under the existing conditions. Oxygen cylinder rescue method is simple to use and has strong operability; oxygen can relieve angina, prevent myocardial infarction, prevent sudden death type coronary heart disease, which has a good therapeutic and palliative effect on asthma, emphysema, pulmonary heart disease and chronic bronchitis. The oxygen cylinder is placed in a specific location in the community; while waiting for the arrival of the ambulance, the gold for four minutes after the accident can be fully utilized; oxygen cylinders can be used to rescue people with sudden illnesses in the first place, resulting in saving lives and increasing their survival rate. At the same time, patients with chronic diseases can improve their quality of life by lending oxygen cylinders in a breathing-impaired environment. Putting the oxygen cylinder in the community can make the first aid closer to people's lives, improve the society's attention to first aid awareness, and make the first aid popularization knowledge deeper. With the improvement of people's quality of life and awareness of first aid, more and more families will be equipped with oxygen cylinders, but the use rate of oxygen cylinders in each household is not high. Therefore, the sharing of oxygen cylinders can maximize the utilization of oxygen cylinders and reduce unnecessary waste, which is conducive to raising people's awareness of resource conservation and building a resource-saving society. While benefiting others, people's sense of social participation has been improved, and the social environment has been improved, and the construction of spiritual civilization has played a certain role in radiation.

Status of Use of Household Oxygen Devices

Survey of applicable population. Sudden disease population: Reports from the National Center of Cardiovascular Diseases, China show that the prevalence of cardiovascular disease in China is on the rise. At present, the number of sudden cardiac deaths in China exceeds 540,000 per year, which is equivalent to one person suffering from sudden cardiac death every minute. There are many causes of

cardiac arrest; acute myocardial infarction is a serious type of coronary heart disease, which is the first cause of sudden death, accounting for more than 80% of the total number of cardiac arrests. Relevant statistics show that about 70% of emergencies such as sudden death occur at home, 25% of emergencies occur in other situations, and only 5% of emergencies occur in hospitals. Of the patients who died in various occasions outside the hospital, 65% died within 15 minutes after the onset, and 35% died 15 minutes to 2 hours after the onset. Oxygen inhalation therapy can be used to increase arterial oxygen partial pressure and oxygen saturation, improve tissue hypoxia and hypoxia, and promote the maintenance of normal body metabolism and life activities, which is a basic rescue and treatment technique. However, in the event of a sudden onset of cerebral hemorrhage, asthma, heart disease, etc., if there is no oxygen bottle around, it is difficult to implement oxygen supply first aid; sometimes an ambulance can encounter traffic or weather, which can't be reached quickly, and the best rescue time is likely to be missed.

People with respiratory diseases: 87% of the total death toll in China is caused by chronic diseases, of which chronic respiratory diseases account for 11% of the total number of deaths, ranking third. Now in China, air quality is declining, smog is serious, and people suffering from respiratory diseases are increasing. In an environment of hypoxia such as low weather and severe haze, patients with respiratory diseases (eg, bronchitis, asthma, emphysema, pulmonary heart disease, lung infections, etc.) and their poor blood circulation (eg, various heart diseases, cerebral insufficiency, cerebral infarction, vasculitis, varicose veins, etc.) inhale oxygen to alleviate the symptoms of their breathing difficulties and improve their quality of life. Pregnant women and other people: Pregnant women often feel hypoxic during pregnancy; when the psychological stress of work and life is too high, the air pressure is low, and the smog is severe, people will feel oxygen deficiency, then oxygen cylinders are needed.

Type of oxygen generators. Medical oxygen, medical ozone and corresponding oxygen production equipment are popular medical products in the international market. As people's income increases and the Engel coefficient decreases in China, people are paying more and more attention to their own health, so various small or home medical products will be applied to ordinary families. In the United States, more than 100,000 sets of 5L PSA oxygen generators are produced and sold each year; nearly 30% of the elderly's families are equipped with oxygen pillows, oxygen cylinders, and even household oxygen generators. In the European and American markets, small or domestic PSA oxygen generators can generate billions of dollars in annual sales. Even in nursing homes, rehabilitation facilities and gyms, PSA oxygen generators are available to allow people to take oxygen at any time. [1]

Community Sample Survey

Taking Baofeng Chongren Community as an example. The research community is located at Chongren Road, Baofeng Street, Qiaokou District, Wuhan City, Hubei Province, China. There are a total of 712 houses in the community, with a total of five buildings. According to the survey, people with respiratory diseases in the community account for 30%; in the distribution of community population, nearly half of people with respiratory diseases are people over 50 years old. The per capita income of people in the community is 5,000 yuan. The No. 1 Building, the No. 2 Building, the No. 3 Building and the No. 3 Building in the community are all 18-storey buildings; it takes 3 minutes for people to take the elevator from the top floor to the ground; the No. 4 Building has a total of 26 floors, and it takes 4 minutes for people to take the elevator from the top floor to the ground; there are 216 households in the No. 1 Building, 72 in the No. 2 Building, 144 in the No. 3 Building, 208 in the No. 4 Building, and 72 in the No. 5 Building; according to the number of people and the distribution of buildings, two shared oxygen tank rental boxes are placed between the No. 3 Building and the No. 4 Building and between the No. 1 Building, the No. 2 Building and the No. 5 Building.

User needs survey. Through the investigation of the shared oxygen supply device of the community residents, the current situation of the population distribution of the community, the illness

of the residents in the community and the attitude towards the shared oxygen supply device are learned. The actual research is used to verify the data sought, to demonstrate the value of the shared oxygen device, and to determine that the shared oxygen device is what the user really needs; rather than empty talk, user needs and pain points will be further explored to provide demand for later designs. With the improvement of life and lifestyle, people pay more and more attention to the health of themselves and their families, and are willing to invest time and money in health and improve their quality of life. In China, the population is dense, people live in groups, but the population is gradually aging, and the demand for oxygen supply devices is huge.

After the questionnaire and focus interviews, the following requirements are summarized that:

1) can be rented more conveniently without using a mobile phone; 2) provide a registration tutorial; 3) provide a registration card, which can be used without a mobile phone; 4) Oxygen cylinder use steps are provided; 5) the rent is cheap; 6) the operation interface is convenient and concise; 7) health knowledge of oxygen cylinders; 8) easy to carry oxygen cylinders; 9) obvious function; 10) celebrity endorsements; 11) convenient payment (Alipay, WeChat); 12) simple registration; 13) using a flowchart; 14) provide the steps for using the oxygen cylinder; 15) beautiful and styled APP interface; 16) fewer steps to use for APP; 17) locate the nearby oxygen device point; 18) Repair the damaged devices.

Design Concept of Community Sharing Oxygen Supply Device Service

Design concept of sharing oxygen supply device. The mobile client APP cooperates with the oxygen supply device to realize the user self-borrowing and returning oxygen supply device. When the user needs to use the oxygen equipment, the user only needs to go downstairs to take out the oxygen device in the self-service rental machine where the oxygen device is placed in the community. The user can successfully obtain the oxygen device by scanning the QR code on the electronic rental screen with the APP on the mobile phone. When returning, the user can automatically scan and recycle the oxygen device at the access point of the self-service rental machine. After the user returns, the app will display the rental fee calculated according to the rental time. The user can complete the payment through Alipay, WeChat Pay and other mobile payment. Each oxygen supply device is equipped with a positioning system for safety management and damage accountability.

Design Ideas on the Mobile Phone App. The user can complete the rental behavior through the mobile terminal APP assistance, so the behavior design and operation process of the mobile terminal are particularly important. After the user logs in, user can quickly enter the rental page, quickly scan the code to complete the lease, and the entire rental process is simple and fast. The user's credit score will be displayed on the APP. Deductions and compensation will be executed based on untrustworthy behavior such as the failure to pay the amount on time, destroying the rental device, etc. After deducting a certain score, the user will be blacklisted to prohibit the rental of device.

1) User behavior. In *Design Art Psychology*, Liu Sha said: "User habits will reduce the degree of thinking interference, promote user behavior and improve user proficiency." [2] The use of the shared-type device APP is mostly for middle-aged people over the age of 30; as an APP used with the device, the main requirement of the user is that the operation is simple, so the interface design of the APP needs to be sufficiently simple, and the interaction design needs to be familiar to the user.

2) Functional design. From the functional context representation interaction logic analysis, it is divided into functional style and behavior style. With the deepening of user data mining and research using big data technology, functional style and behavior style show a convergence trend. [3] The sharing type device APP provides users with the function of renting oxygen equipment.The user's familiar interaction behavior and organizational design of the interface can meet the user's simple operation requirements. The sharing type device APP also provides the user with the function of "finding a nearby doctor" to increase the function and practicability of the APP, and organizes the information of the APP interface in a functional style.

3) Interface design. The user product-based Internet product interface design principles mainly

include the following five aspects, including the principle of consistency, the principle of convenience, the principle of feedback, the principle of providing simple error handling, and the principle of reducing the burden of short-term memory. [4] In the interface design, interface elements can be satisfied, such as the consistency of design elements such as font, kerning, and icons. When the user operates, the principle of convenience needs to be kept in mind. In the interaction design, the user's operation is achieved with as few steps as possible. The user's next operation needs to be timely feedback, such as whether to confirm the entry and use the fastest time to make corrections. The interface function bar is defined, the user's next step is reduced, and the user's next operation behavior is clarified. The user's wrong operation needs to respond in time, such as incorrect password input, returning the wrong position, etc., so that the user can memorize the burden and the user's operation function position is conspicuous.

The APP uses a simple design style, respects the design of the function, and uses the human core as the core to design the product from the function. [5] APP meets the user's needs for the use of leased oxygen device, and pays attention to the user's needs when using. Based on the applicable crowd and function, the interface color of the APP is mainly light blue, which reflects the sense of medical care, comfort and health, reduces the fear of the medical device to bring people, and makes the APP more affinity and meet the emotional needs of users.

Specific Design of Sharing Oxygen Supply Device

The design of the shared oxygen supply device should be ergonomic and convenient for users to borrow. The three views of the design are shown in Figure 5. According to the maximum height of the human body in the erect state of 1700cm-2200cm, the height of the equipment is set to 1800, and the highest level of the cabinet is less than 1700cm, which is guaranteed for all users to borrow. The oxygen content of the oxygen device in each pickup and the time of continuous oxygen use will be indicated on the electronic screen, and the user can choose according to the situation. After selecting the corresponding pickup on the electronic screen, the QR code to be scanned is displayed; after the user scans the QR code using the mobile phone APP, the pickup will open; the user can remove the oxygen device from the pickup and remove the disposable nasal cannula.When returning, place the oxygen device in an empty pickup and confirm the return on the mobile APP.

Interaction Design of Community Sharing Oxygen Supply Device APP

Pre-concept of intelligent service system for community sharing oxygen supply device APP. The APP design is based on the design of human behavior. Based on user needs and research, the following ideas are drawn: 1) Register to log in to the home page; 2) After entering the homepage, the rental page appears. The rental page will display the scan code. The user can use the APP to scan the QR code on the screen to successfully rent. 3) When returning, the user can select the return identifier on the APP, and the user puts the oxygen device into the designated returning position; after the return is successful, the APP calculates the rental fee through the rental time, and the user can pay the fee through electronic payment such as Alipay and WeChat Pay; 4) Users can click on the "finding a nearby doctor" function block to quickly find a doctor registered nearby on the APP and quickly reach the patient location for diagnosis and treatment. It is concluded that the community-based oxygen supply device APP intelligent service system concept framework becomes the basis for the interface of the APP front-end visual interaction system.

Interface visual design scheme of community sharing oxygen supply device APP. The community-sharing oxygen supply device APP interface is designed for mobile phone client, which can meet the mobile phone usage size and smooth use process to meet the user's operation process; in the rental interface, through the simple interface, the maximum use of the function is achieved, and the least steps are used to achieve the goal. When the user operates, the user is given operational instructions, and the user is determined to operate, reducing errors in the operation. When you enter the open screen, the design icon will appear; in order to facilitate the user's memory, the APP is named

Chinese "氧一下" , which has the same pinyin pronunciation with the Chinese "养一下" , which you can understand as nursed back to the body, through the use of oxygen cylinders, to make users more healthy; the minimalist login homepage gives users a clear feeling of the simple style of the app. The home page is the scanning rental module. The scanning QR code key occupies the largest proportional spatial position of the interface, and cooperates with the map route to highlight its important functions and is convenient for users to find. In the user information section, the user's basic identity information is displayed; user account security is guaranteed via user's real-name authentication and identity bindings such as Alipay and WeChat. The user's rental history, wallet balance, and card coupons are also displayed in the message. The "finding a nearby doctor" interface can be switched between the interface header position and the rental module. After the user finds a nearby doctor, the doctor can change the doctor's hand to see the doctor's introduction until the user is satisfied, so that the user can seek medical treatment.

Summary

With the improvement of the level of demand, people pay more and more attention to the health of themselves and their families, and hope to improve the quality of life through the protection of health. However, the current haze environment also affects people's lives. Therefore, a community-sharing oxygen supply device intelligent service system is designed. The development of information and the improvement of people's quality make it possible to share the oxygen supply device. Then, based on the mobile phone APP, an interactive system designed with the smart device can facilitate the user to rent the oxygen device. The device positioning and the network connection are convenient for the user to use and also facilitate the management of the administrator. This design makes it possible to share medical facilities and become a new treatment that allows people to treat at home and directly contribute to patients with sudden illness.

Acknowledgements

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