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Research on the Design of Shared Medical Services to Improve Medical Issues for International Students: Focusing on international students in Korea

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Abstract:
With the rise of the sharing economy, the medical service field has gradually shifted to a sharing model, providing international students with a more convenient and efficient medical experience. This article first investigates the development background and current situation of shared medical services, and analyzes its advantages and limitations in meeting medical needs. Secondly, through case analysis of multiple shared medical applications, the current problems and shortcomings are revealed. Subsequently, through qualitative research methods, an in-depth investigation and analysis of international students' experiences in health care were conducted, and challenges such as language barriers and insurance claims were discovered. Finally, combined with the research results, strategies and suggestions for improving shared medical services are put forward to promote the development of the medical system and improve the medical experience of international students. This study aims to explore the impact of shared medical services on foreign students and its potential role in solving medical problems. Through the findings of this study, it is hoped that it can provide a reference for the improvement of the social medical system in the future, and provide theoretical and practical support for more international students to provide better and more convenient medical services.

Keywords:
Medical issues for international students , medical user interface, service design

1.Research background and purpose

In recent years, with the rise of the sharing economy, the use of various shared products and shared services has continued to increase. This economic model not only encourages efficient use of resources, but also expands the scope of services, and its impact has extended to many industries such as the medical field. As part of the sharing model, shared medical services effectively integrate professional medical resources by building an Internet platform to quickly meet various medical service needs. With the development of shared medical services, the policy for foreign students to participate in medical insurance in South Korea has gradually improved. However, due to language barriers and the uncertainty of health insurance claims, foreign students are sometimes unable to receive timely treatment and therefore fail to immediately resolve physical or mental

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health issues. Therefore, improving the medical experience of international students has become a current issue that needs to be solved.

The purpose of the study is to understand the medical issues faced by international students, the interface and service design of shared medical applications, and related circumstances.Analyze the characteristics and functions of shared medical service application cases and understand current problems. Finally, through interviews with international students, the study analyzes the challenges they face in accessing medical services and proposes improvements. Through the above survey, it is expected to provide directions for improving the social medical system and provide higher quality and convenient medical services for more international students.

2.Research scope and methods

The research scope selected the shared medical application with the highest number of downloads in the mobile application store as the research object. Since Chinese students are the largest group of international students in Korea and have high demands for medical services.Therefore, this study selected three most popular shared medical applications in China and South Korea for research. The research methods are as follows. First, by investigating the medical problems faced by international students, we can understand the current medical difficulties they face. Second, analyze the cases of shared medical applications with high download volume and understand the characteristics and functions of these shared medical applications. Finally, through questionnaires, we understand the needs and expectations of international students for medical services, and based on these data, we propose directions for improving shared medical applications in the future.

3.Theoretical background

3.1. Medical issues for international students

As the global influence of Korean culture continues to grow, more and more people are choosing to study in South Korea. Especially in the context of K-pop becoming popular all over the world and South Korea's international influence increasing, the number of Korean students studying abroad has shown a sharp upward trend. According to data from the "Korea Educational Development Institute Education Statistics Service", as of April 1, the number of foreign students in Korean schools was 166,869, an increase of more than 10% compared with the same period last year, and is expected to continue to maintain a growth trend. However, the rapid increase in the number of students studying abroad has also brought various challenges and problems. Due to language and cultural differences, international students face various problems in communicating and adapting to the new social environment. Among them, these problems are particularly prominent in the medical field. Language and cultural differences among international students have become major obstacles for international students when using medical services. In addition, some international students often fail to receive basic medical services such as regular medical examinations due to difficulty adapting to the new social environment. The proportion of international students who choose to take a break or drop out of school due to physical or mental health problems continues to increase every year.

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3.2. Service design

Service design is a method dedicated to discovering the latent needs of suppliers and demanders and developing products and services that meet these needs. It is based on user experience and uses a variety of methodologies to create new value and is widely used in various fields of industry and society. In modern society, services run through every aspect of our lives, including restaurants, hotels, public places, shops, banks and insurance companies, etc. With the development of society and the continuous improvement of consumer expectations, some existing service facilities and systems can no longer meet consumer needs. In this context, service design is committed to building a perfect user experience by deeply tracking the user experience process, covering all touch points, and has become a key means to improve service quality and user satisfaction.

In contemporary society, the user experience at every stage-pre-sale, during the sale, and post-sale-directly affects the image of brands and businesses in the minds of consumers. Consumers can evaluate and compare products and services they use within minutes. Therefore, businesses need to take greater responsibility for their actions and the products and services they provide, with special attention to the service experience conveyed. The value and significance of service design lie not only in optimizing user experience but also in enhancing business competitiveness through innovation and efficiency improvements. In today's competitive market environment, service design empowers businesses with strong competitiveness to adapt to constantly changing consumer needs and continuously create value.

3.3. The relationship between shared medical applications and service design.

Service design is viewed as a strategic and comprehensive approach that aims to enhance customer experience and optimize interactions between service providers and users. This approach emphasizes user-centered design principles to ensure that services meet user needs. When considering medical services for international students, we must first consider the language and cultural differences of users, as well as the communication difficulties caused by these differences, so it is crucial to adopt a user-centered design strategy.Given that international students come from different countries and have different cultural backgrounds, service design must fully take this diversity into account to ensure that the specific needs and situations of different users are met. At the same time, the ease of use, convenience and accessibility of services should be the focus of the design to optimize the overall service experience. In order to overcome communication barriers caused by language and cultural differences, service design should also include strengthening communication strategies to ensure the smooth transmission of information.Finally, service design should provide clear medical service information to international students, helping them accurately access the information they need. By employing user-centered design principles that emphasize diversity and convenience and address communication issues arising from language and cultural differences, service design plays a critical role in developing and optimizing shared medical applications. This not only helps improve the medical service experience for international students but also ensures that the medical applications better meet the specific needs of this student group.

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4.Current status and characteristics of shared medical applications

4.1. Current status of shared medical applications

With economic development, various types of medical applications have emerged in the market, featuring diversified functions that make medical resources more accessible and meet the needs of different users. Current medical applications provide a variety of functions such as accessing general disease information, managing personal health records, interpreting prescription information, tracking health data, and offering remote consultations. However, despite the expanding market and increasing diversity of functions, there are still some deficiencies. Most medical apps are primarily developed for local users and do not fully consider the unique needs of international students. Existing medical applications fall short in areas such as crossnational diversity, cultural adaptability support, language barrier resolution, and emergency response, failing to meet the special requirements of foreign students. This can pose difficulties for foreign students in using these applications, thereby affecting their medical service experience.

4.2. Shared medical application case analysis

In order to objectively analyze the functions and characteristics of current shared medical applications, this study selected the six most downloaded medical applications in the mobile app store for detailed analysis, including three Chinese and three Korean medical applications. (Figure 1)

App	Features provided	language	emergency services	Special feature
Ding Xiang Doctor	−Online health consultation and appointment −Remote online diagnosis and treatment −Drug notification and purchase services	Chinese	Provide emergency services	−Professional medical team −full range of online medical services
PingAn JianKang	−Health insurance services −Online diagnosis and treatment and doctor consultation −Drug notification and purchase services	Chinese	Provide emergency services	−Integrated insurance services −comprehensive health management services
DingDang Pharmacy	−Pharmaceutical procurement and distribution −Online prescription submission and consultation −Provide health information	Chinese	Provide emergency services	−Quick purchase and delivery of medicines, simple online prescrip−tion consultation services
goodoc	− Search health information −Make an appointment for medical treatment and health check−up	Korean	Provide emergency services	−Health information search −online appointment service
hidoc	−Appointment for medical treatment and fees −Face−to−face diagnosis and treatment −Health examination and consultation services	Korean	Provide emergency services	−Online appointment for diagnosis −Therapy and telemedicine services
bedoc	−Make an appointment for medical treatment and health check−up −Provide health information	Korean	Provide emergency services	−Online medical appointments −convenient health information inquiry

Figure 1. Function and feature analysis of six shared medical applications

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In addition to the analysis of functions and features in Table 1, in order to have a more comprehensive understanding of the functions provided by these six shared medical applications, this article also conducts a detailed comparison of the basic functions of these applications. (Figure 2)

Comparison of basic functions of shared medical apps in China

Appapplication	Surrounding hospitals	Online consultation	drug sales	Pharmaceutical Distribution	Pharmacist guidance	Popularization of health knowledge	doctor lecture	Information Sharing
DingXiangdoctor	●	●	●	●		●	●	●
Ping AnJian Kang	●	●	●	●		●		●
DingDang Pharmacy		●	●	●	●	●		

Comparison of basic functions of Korean shared medical apps

Appapplication	Surrounding hospitals	Find nearby hospitals	cosmetic surgery	Doctor Consultation	Patient Sharing	Popularization of health knowledge	doctor lecture	Information Sharing
goodoc	●	●	●		●		●	●
hidoc	●	●		●		●		●
bedoc	●				●			

Figure 2. Comparison of basic functions of six shared medical applications

After detailed analysis of the functions and features of the six shared medical apps as presented in Table 1 and Figure 1, the following conclusions are drawn.Firstly, although these applications provide a variety of functions such as online medical consultations, doctor appointments, medication purchasing, health information queries, and telemedicine, most of the offered functions are similar. Secondly, none of these six shared medical applications supports multiple languages, which may cause nonnative users to encounter difficulties in language communication, thereby affecting the use experience and reducing the accessibility of services. In addition, these applications generally provide emergency support such as emergency medical services or emer-gency vehicle services, which can provide users with timely assistance in emergencies.Finally, each app has its own unique features. For example, Ding XiangDoctor APP provides professional medical team support, Ping AnJianKang provides health management services, and DingDangPharmacy provides fast drug purchase and delivery and online prescription services. Although these six most downloaded shared medical apps have many features and benefits, they still show certain limitations when facing foreign users.

5.International student interviews

5.1. Interview structure

In order to gain an in-depth understanding of the medical problems faced by international students in South Korea, a total of fifty international students (including 21 males and 29 females) were surveyed this time, all aged between 20 and 30 years old. Through face-to-face interviews, detailed understanding of international students' experiences and opinions on medical services.

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5.2. Interview content

The interview content mainly focused on three aspects. First, focus on the medical service experience. The experience and satisfaction of international students in using medical services were collected, especially feedback on processes such as appointment, diagnosis, treatment and prescription. At the same time, experiences in convenience, efficiency and quality of medical services were explored from multiple aspects. Secondly, focus on the demand for medical services. Understand the needs of international students for special medical services and additional support, and conduct a detailed investigation of those parts of medical services that require further improvement.Lastly, the relationship between language barriers and medical services was explored.The survey investigated experiences where language difficulties impacted the use of medical services and discussed the necessity of providing language support. Information on how language barriers affect the use of medical services was collected, and suggestions were made to address this issue.

5.3. Interview results

Through interviews with international students about their experiences and satisfaction with medical services in South Korea, several issues were identified. Firstly, many students are not very familiar with the Korean medical system, especially the appointment and diagnostic procedures, which makes it difficult for them to effectively use these services. Secondly, language barriers present a significant issue; limited proficiency in Korean is one of the main problems, making it hard for many students to communicate effectively during medical services, which affects their understanding and adherence to doctors' advice. Additionally, cultural differences also pose a problem. Some students mentioned that the communication style between doctors and patients in the Korean medical system differs from the medical culture in their home countries, leading to communication difficulties. Lastly, international students are not well acquainted with South Korea's national health insurance system, which leads to inconveniences in medical cost payments and reimbursement procedures, and a lack of necessary guidance.

International students have put forward the following requirements and suggestions for improvements in medical services. Firstly, they suggest increasing multilingual support in medical services, including translation services in Chinese and English, to help international students better understand and communicate medical information. Secondly, there is a recommendation to establish an online appointment system and information platform, allowing students to understand relevant medical service details in advance, such as physician qualifications and consultation procedures. Thirdly, international students expect medical services to provide more transparent cost information, including detailed treatment costs and insurance reimbursement processes, to help them understand and plan medical expenses more clearly. Lastly, there is a desire to establish a medical feedback mechanism that makes it easier for the student community to access feedback on hospitals and doctors' services, promoting the continuous improvement of medical services.

Finally, in response to language barriers and medical services, international students have made the following suggestions: Firstly, they recommend providing professional translation services to facilitate smooth communication between patients and doctors and ensure correct understanding of medical advice. Secondly, there is a suggestion to increase multilingual medical teams, particularly by adding doctors who can communicate effectively with international students in languages such as English, to reduce the impact of language

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barriers. Additionally, it is recommended that medical staff receive education about patients from different cultural backgrounds to better understand and adapt to cultural differences. These specific feedbacks will help in designing future medical service systems that better meet the needs of international students and improve service quality.

5.3. User journey map

After organizing the interview results of international students, a user journey map was created to visualize the entire process of international students visiting hospitals, thereby identifying the experiences and problem points at each stage. This content is detailed in "Figure 2." This process breaks down the hospital visit of international students into nine stages for more thorough observation. In the early "cognition stage," international students first encounter difficulties in gathering information due to language and cultural differences, and then face challenges at multiple stages, including making appointments, arriving, waiting, consulting with doctors, undergoing examinations, visiting pharmacies, following up on treatments, settling payments, and discharging. Such detailed phase-by-phase analysis clearly reveals the various difficulties and inconveniences that may be encountered in using medical services. Particularly, language barriers, a lack of understanding of medical terminology, and problems with effective communication with doctors have become major issues. These problems will serve as the foundation for design and are considered important indicators for advancing customer-centric, effective, and friendly medical service design. Through these analyses, a better medical service experience can be provided, exploring directions for improvement, to minimize the burden on international students when using medical services. (Figure 3)

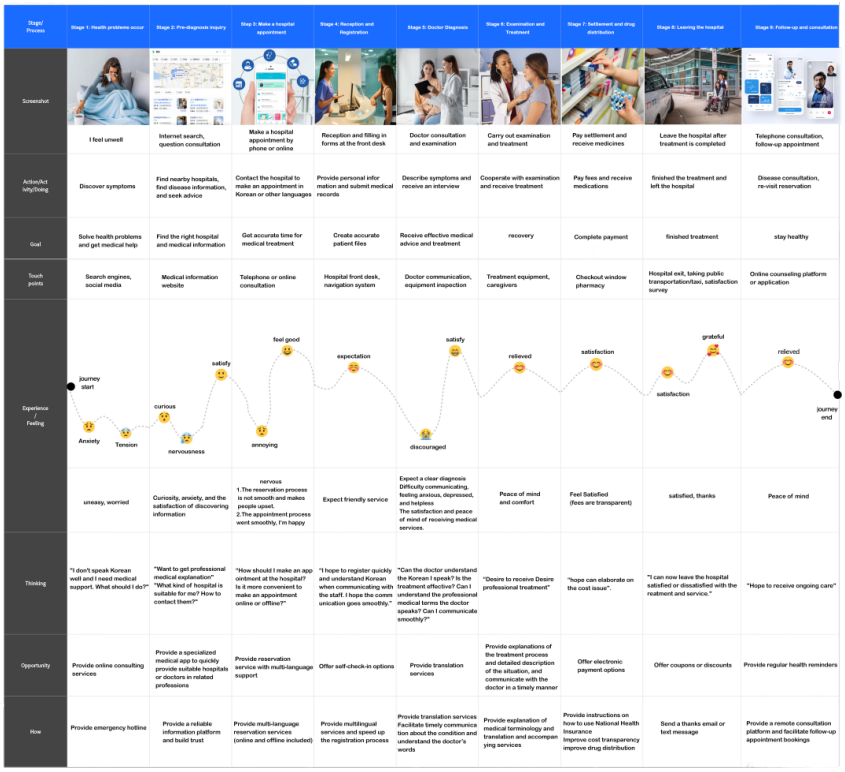


Figure 3. User journey map

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6.Service design for shared medical applications

6.1. Design Composition

Based on the interview results with international students and the analysis of the user journey map, a comprehensive medical service app for international students is proposed to improve their medical issues. This application takes into account the various stages that international students encounter when using medical services, aiming to provide a better medical experience. The relevant conceptual elements can be found in "Figure 4." (Figure 4)

Elements	Content
translation service	Providing translation services for medical terminology, users can obtain language support at any time.
Multilingual doctor services	communicate with doctors in multiple languages during consultation.
Application translation service	With the one-click translation feature within the app, users can easily translate messages into their native language.
Find nearby hospitals and pharmacies services	1. By measuring the location on the map, you can find nearby hospitals and pharmacies. 2. Search the names of hospitals, doctors, and pharmacies to find location information.
Search disease services	1. The disease can be predicted by searching for symptoms. 2. Asking about symptoms allows doctors or patients to answer questions about the disease.
Detailed introduction of services of hospitals and doctors	introduce the hospital and doctor's name, price, location, diagnosis and treatment area, treatment time, experience, ratings and other detailed service details of the hospital and doctor.
Hospital appointment service	When you want to go to the hospital, you can make an appointment directly on the APP.
Online consultation service	Through the application, you can use text, photos and videos to communicate with doctors for consultation. After consultation, a prescription can be made.
Drug ordering service	After getting the prescription, you can order the medicine at the pharmacy. After making an appointment, you can pick up your medicine directly from the pharmacy or through a pharmacy delivery service.
Follow-up Notification Service.	If follow-up treatment is needed, Users can prepare in advance through notifications.
national insurance service	The app makes it easy to learn about insurance National Insurance application services.

Figure 4. Design concept elements composition

6.2. Design Direction

Based on the conceptual elements in Table 3, the interface design direction of shared medical applications is proposed, aiming to improve the experience of international students in Korean medical services. Its goal is to solve various problems faced by international students in the process of medical services by providing a user interface with multi-language support and comprehensive medical functional services.

The design direction primarily focuses on resolving language barriers for international students. The application offers translation services for medical terminologies, ensuring users have access to multilingual support at any time. Additionally, it introduces services from multilingual doctors who can provide consultations in English, Chinese, or other languages, facilitating smooth communication with doctors. Furthermore, the design of the application considers enhancing the accessibility and understanding of medical information. With a translation button on the application interface, users can easily translate medical information into their native languages, thus improving the efficiency and accuracy of information transmission. Lastly, by creating a comprehensive medical service platform that includes hospital appointments, online consultations, and pharmacy bookings, users can complete multiple stages of medical services within one application, enhancing the convenience and integration of the services.

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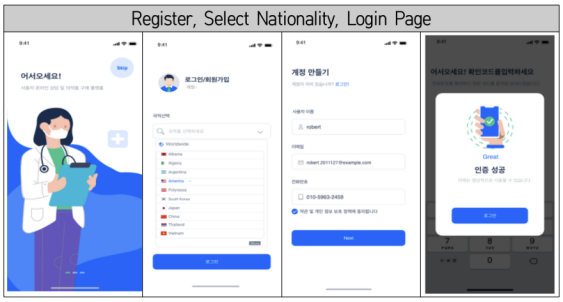


Figure 5. Registration, nationality selection, login page design

The design of the registration, nationality selection, and login pages aims to provide multilingual support and a simplified registration process to meet the needs of international students. The registration page particularly emphasizes multilingual support, allowing users to quickly complete the registration in their own language. Additionally, the nationality selection interface has been optimized to make it more intuitive and quicker to select a nationality. The login page offers multiple language options, facilitating users to log in in their own language. These design improvements are intended to enhance the usability and accessibility of the user interface. (Figure 5)

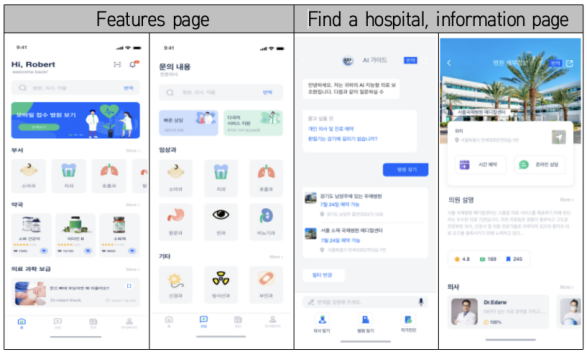


Figure 6. Functional page design

The design of the medical service functionality page focuses on providing multilin-gual translation features, allowing users to understand medical terminologies at any time. Additionally, the page incorporates services from multilingual doctors, enabling users to receive medical consultations in their own languages. This design direction is aimed at improving language communication issues in medical services for internatio-nal students and enhancing the accessibility of the services. (Figure 6)

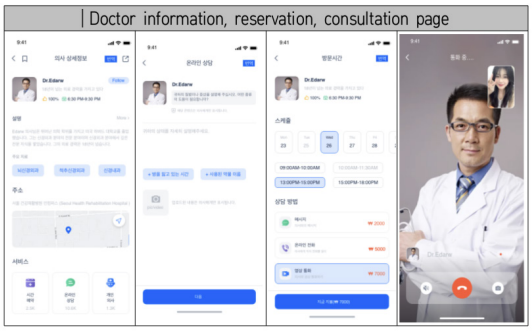


Figure 7. Doctor information, appointments, page design

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In the design of the hospital search page, the focus is on providing guidance services with multilingual support, enabling international students to easily find hospitals in their own language. This is intended to address the language barrier issues that international students face when seeking medical services in a foreign country. (Figure 7)

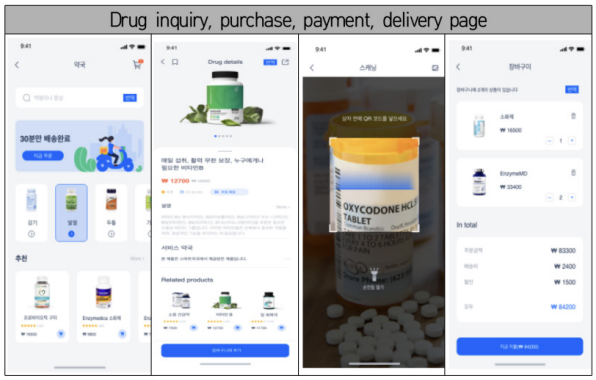


Figure 8. Drug information, translation, purchase page design

The design of the medication inquiry, purchase, payment, and delivery pages integrates these functions to build a comprehensive medical services platform. The aim is to allow users to complete all medical service steps through a single application, thereby enhancing the convenience and integration of the services.(Figure 8)

7.Conclusions

As the number of international students in South Korea increases dramatically, various challenges and problems arise, especially in the medical field. Communication problems caused by language and cultural differences have become one of the important obstacles faced by international students. With this background, this study analyzes the medical service experience and needs of Korean international students and proposes the design direction of shared medical applications.

The design direction aims to provide international students with a more convenient, smooth and personalized medical service experience by providing innovative functions such as multi-language support, multi-lingual physician services and APP translation services. The proposal for this design direction is based on an in-depth analysis of the interview results of international students and the user journey, and aims to help international students solve various problems encountered in medical services such as language communication, information acquisition, and medical appointments. Taking into account the design direction and background, the development of shared medical applications will not only help improve the medical service experience of Korean international students, but is also expected to provide valuable experience for the internationalization of the Korean medical service system and reduce the impact of language and cultural differences on medical services. , to create a friendly and accessible medical service environment for international students.

It is hoped that through the combination of information technology and medical services, smooth communication between international students and medical service providers will be promoted and the overall medical experience will be improved. However, the main survey subjects of this article are Chinese international

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students, so there are certain limitations.

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