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Determining the minimal dataset for a mobile-based self-care educational system for corneal transplant patients

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ABSTRACT

Self-care methods for patients with corneal transplants are very important. Currently, traditional self-care guidelines have limitations. Determining the minimal dataset for a self-care educational system is essential to improve the quality of content and services provided to corneal transplant patients. This study aimed to determine the necessary dataset for a corneal transplant educational system. This applied research study was conducted using a descriptive-developmental approach in 2022-2023. In the first stage, the researchers identified the clinical-educational content required, and the questionnaire's content validity and face validity were evaluated by six ophthalmologists and ten faculty members of the Department of Health Information Technology and Medical Informatics. The reliability of the questionnaire was calculated using Cronbach's alpha with SPSS software version 26. Among the elements surveyed, those with a mean score above 3.5 were selected as essential data elements, and those with a mean score between 2.5 and 3.5 were selected as desirable data elements. The minimal dataset for a self-care educational system was presented in four sections: demographic data elements, clinical data elements, educational data elements, and functional and technical requirements. A proposed model for an electronic educational system can be developed based on the results.

Keywords: Self-care, Mobile Health, Corneal Transplant, Telemedicine, Patient Education

INTRODUCTION

The cornea is a transparent part of the eyeball located in the anterior portion of the eye, naturally covered by a layer of tears (1). Corneal diseases are the second leading cause of blindness in developing countries, and it is estimated that 23 million people worldwide suffer from unilateral blindness, while 4.9 million are blind in both eyes. The epidemiology of corneal diseases leading to corneal transplantation varies from region to region. In some areas, keratoconus is the main cause of corneal transplantation, while in others, bullous keratopathy is the most common cause (2, 3).

Corneal transplantation is the oldest and most successful transplant surgery (4). In this procedure, the patient's damaged cornea is replaced with a donated cornea, either in part or in whole (5). It involves transferring donor corneal tissue to replace the recipient's tissue, including two forms: full-thickness or penetrating, and lamellar (6). Corneal transplantation is the most common type of human tissue transplant in the world, with more than 180,000 corneal transplants performed annually worldwide and 7,000 to 8,000 in Iran, and this number is increasing. The goal of corneal transplantation is to restore visual function and improve vision, as well as to help alleviate pain caused by chronic corneal edema, and in most patients, to correct the optical properties of the eye (7, 8, 9, 10).

Complications of corneal transplantation include primary donor failure, delayed graft failure, cataracts, suture abscess, graft vascularization, severe astigmatism, allograft rejection, superficial punctate keratitis, late graft failure, and increased intraocular pressure (11, 12).

Complications of corneal transplantation that prevent visual improvement are always an ongoing concern (13). There are many methods to prevent corneal transplant complications; self-care is one of these methods, and adherence to self-care practices is of great importance for individuals with corneal transplants (10).

Self-care consists of conscious, learned, and purposeful actions and activities performed by an individual to maintain life, ensure and promote their own and their family's health, and prevent and combat disease. Self-care is part of daily life and is not a substitute for specialized and organizational care, but rather complements it. It is more about interacting with the health care system than being independent from the specialized care system. The most important achievements of strengthening self-care are that individuals make correct decisions about the proper use of health care and appropriately choose and implement self-care behaviors. The self-management program covers areas such as health maintenance and promotion, lifestyle modification, disease prevention, symptom assessment, disease treatment, and rehabilitation (14).

Eye diseases have been one of the most important diseases in recent years and have incurred significant costs for the country. Despite the increase in these diseases, appropriate measures can be taken to reduce the occurrence of their complications (15). For this reason, health care policymakers place great importance on the active role of patients in disease management. On the other hand, the role of self-care programs in controlling and preventing corneal transplant complications is of interest (16). However, these patients lack sufficient knowledge to manage their disease. In this regard, successful management requires educating these patients (17). Today, the greatest emphasis on new care models for disease management is on the impact of care and quality of life and their combination with technology. In this context, mobile technology combined with medical expertise has provided a new possibility called mobile health, which, due to the pervasiveness of mobile technology, provides new opportunities to improve patient health (18).

In modern medicine, a vast amount of data is generated, but there is always a deep gap between data collection and its understanding and interpretation. On the other hand, the available data is voluminous and confusing. For this purpose, for most services provided, a minimum data set creates a standard method for collecting key data elements that facilitates their understanding and comparison. It also allows the healthcare institution to identify one patient from others and meet government requirements, the internal needs of each institution, and ultimately the medical community (19).

The minimum data set, as the minimum health data, is a standard method for collecting, storing, and distributing key and standard data elements. The minimum data set leads to the use of standardized information elements with uniform definitions for data matching and comparability (20). A minimum data set is a collection of the smallest number of agreed-upon data elements for documenting and reporting requirements at the national and international levels (21). Given that in Iran, a minimum data set for corneal transplantation has not been designed, and data is collected in a scattered and varied manner in ophthalmology clinics and hospitals. Therefore, the aim of this study was to determine the information elements and minimum data set for an educational self-care system for individuals with corneal transplants, in order to take a step towards improving the health of individuals with corneal transplants and ensuring key data for this surgical procedure.

METHODS

This was an applied study using a descriptive-developmental approach conducted in 2022-2023. In the first stage, the researchers identified the educational-clinical content needed to design a mobile-based educational system for the self-care of individuals with corneal transplants. For this purpose, to determine the data elements and technical capabilities of the educational system for individuals with corneal transplants, a researcher-made questionnaire was designed using library and internet resources, including books, articles, and printed and electronic theses related to the subject in databases such as the Iranian Research Institute for Information Science and Technology, the Country's Publications Information Bank, the Scientific Information Database of the Academic Center for Education, Culture and Research, ScienceDirect, Google Scholar, and PubMed. This questionnaire covered reasons, complications, types of corneal transplants, drug treatment, identification, and factors affecting education, recovery, control, and rejection of transplants. It was designed at the Noor Afarin Specialized Ophthalmology Clinic in Mashhad.

The content and face validity of the questionnaire were then assessed according to the opinion of 6 ophthalmologists and 10 faculty members of the Health Information Management and Technology and Medical Informatics Educational Group. The reliability of the questionnaire was calculated using Cronbach's alpha with SPSS software version 26. This questionnaire consisted of four parts including 26 demographic information questions, 75 clinical information questions, 46 educational information questions, and 46 questions on functional requirements and technical capabilities on a 5-point Likert scale (very high to very low). The reliability of the questionnaire was calculated through Cronbach's alpha. The Cronbach's alpha coefficient was 0.93 for demographic information, 0.95 for clinical information questions, 0.92 for educational information questions, and 0.96 for functional requirements and technical capabilities.

In the next stage, the questionnaire was presented to faculty members of the Ophthalmology and Health Information Management and Technology and Medical Informatics departments of the country's medical universities for survey through email and in person. A 5-point Likert scale was used to score the data elements of the questionnaire, with a score of 5 for the highest importance and a score of 1 for the least importance. Data elements with an average score of 3.5 and above were considered as essential data elements. Elements that scored an average of 2.5 to 3.5 were optional data elements, and if the average score was 2.5 or less, they were considered suggested data elements. Finally, the minimum data set for corneal transplant patients was determined.

This study received ethical approvals from the Ethics Research Committee of Ahvaz Jundishapur University of Medical Sciences, Iran (IR.AJUMS.REC.1401.566).

RESULTS

In this study, first, the data needs were identified from the perspective of ophthalmology specialists and health information management and medical informatics experts. Then, the minimum data set for the corneal transplant educational system was determined based on the research method.

TABLE I. AVERAGE SCORES ASSIGNED TO DEMOGRAPHIC DATA ELEMENTS BY EXPERTS

Number	Data Elements	Average Score	Essential Data Elements	Number	Data Elements	Average Score	Essential Data Elements
1	Patient's First Name	4.1	*	**14**	Caregiver's Last Name	3.4	
2	Patient's Last Name	4.05	*	**15**	Caregiver's Age	3.4	
3	Father's Name	3.55	*	**16**	Caregiver's Gender	3.15	
4	National ID Number	4.6	*	**17**	Caregiver's Education Level	3.8	*
5	Patient's Gender	4.1	*	**18**	Relation to Patient	3.5	
6	Date of Birth	4.25	*	**19**	Smoking Status	4.65	*
7	Weight	3.4		**20**	Alcohol Consumption Status	4.55	*
8	Marital Status	3.25		**21**	Allergy History	4.7	*
9	Education Level	3.85	*	**22**	Eye Disease History	4.7	*
10	Occupation	4	*	**23**	Diabetes History	4.8	*
11	Living Situation (with spouse, alone, family, nursing home)	3.55	*	**24**	Hypertension History	4.7	*
12	Residence	3.2		**25**	Family History of Keratoconus	4.7	*
13	Caregiver's First Name	3.2		**26**	Medication Usage History	4.6	*

Based on the results of the survey (Table 1), the data elements (Patient's First Name, Patient's Last Name, Father's Name, Patient's National ID Number, Patient's Gender, Date of Birth, Patient's Education Level, Patient's Occupation, Patient's Living Situation, Caregiver's Education Level, Smoking Status, Alcohol Consumption Status, Allergy History, Eye Disease History, Diabetes History, Hypertension History, Family History of Keratoconus, and Medication Usage History) with an average score of 3.5 and above were selected as essential data elements.

The data elements (Patient's Weight, Patient's Marital Status, Residence, Caregiver's First Name, Caregiver's Last Name, Caregiver's Gender, and Relation to Patient) scored between 2.5 and 3.5 and were designated as optional data elements.

TABLE II. AVERAGE SCORES ASSIGNED TO DEMOGRAPHIC DATA ELEMENTS BY EXPERTS

Number	Data Elements	Average Score	Essential Data Elements	Number	Data Elements	Average Score	Essential Data Elements
1	Familiarity with Eye Anatomy	4.3	*	**38**	Definition of Corneal Transplantation	4.6	*
2	Familiarity with Glaucoma	4.1	*	**39**	Familiarity with Cornea	4.5	*
3	Familiarity with Cataracts	4.1	*	**40**	Familiarity with Corneal Transplantation	4.5	*
4	Familiarity with Macula	4.2	*	**41**	Objectives of Corneal Transplantation	4.6	*
5	Familiarity with Presbyopia	4	*	**42**	Eye Diseases like Advanced Keratoconus	4.3	*
6	Familiarity with Refractive Errors	4.2	*	**43**	Corneal Thinning and Deformation (e.g., Keratoglobus)	4.6	*
7	Familiarity with Color Blindness	3.6	*	**44**	Infections from Wounds, like Herpes or Fungal Keratitis	4.7	*
8	Familiarity with Night Blindness	3.4		**45**	Conditions from Hereditary Factors	4.05	*
9	Familiarity with Dry Eye Syndrome	4.3	*	**46**	Rare Complications from Refractive Surgery	4	*
10	Familiarity with Watery Eyes	4.5	*	**47**	Corneal Edema after Cataract Surgery	4.2	*
11	Familiarity with Red Eyes	4.7	*	**48**	Corneal Tear	4.4	*
12	Familiarity with Stye	4.3	*	**49**	Severe Dry Eye	4.2	*
13	Familiarity with Conjunctivitis	4.3	*	**50**	Chemical Burns	4.3	*
14	Familiarity with Pterygium	4.4	*	**51**	Repeat Transplant	4.4	*
15	Familiarity with Eye Irritation	4.6	*	**52**	Full-Thickness Corneal Transplant	4.5	*
16	Familiarity with Amblyopia	3.9	*	**53**	Lamellar corneal transplant	3.9	*
17	Familiarity with Strabismus	3.8	*	**54**	Anterior Lamellar Corneal Transplant	3.5	
18	Familiarity with Nystagmus	3.5		**55**	Autologous Therapeutic Lamellar Corneal Transplant	3.3	

19	Familiarity with Eye Tics or Nervous Tics	3.3		**56**	Full-Thickness Anterior Lamellar Corneal Transplant	3.3	
20	Eye Proptosis	4.3	*	**57**	Deep Anterior Lamellar Corneal Transplant	3.5	
21	Eye Fatigue	3.7	*	**58**	Posterior Lamellar Corneal Transplant	3.3	
22	Eye Allergy	4.2	*	**59**	Endothelial Lamellar Corneal Transplant	3.3	
23	Corneal Ulcer	4.7	*	**60**	Autologous Denuded Lamellar Corneal Transplant	3.3	
24	Keratoconus	4.6	*	**61**	Descemet Membrane Endothelial Keratoplasty	3.3	
25	Blepharitis (Eyelid Inflammation)	4.1	*	**62**	Limbal Stem Cell Transplant	3.5	
26	Chalazion (Eyelid Cyst)	4.05	*	**63**	Epithelial Rejection	3.7	*
27	Ptosis (Eyelid Drooping)	4.05	*	**64**	Subepithelial Rejection	3.7	*
28	Diabetic Retinopathy	4.05	*	**65**	Stromal Rejection	3.66	*
29	Retinal Detachment or Tear	4.3	*	**66**	Endothelial Rejection	3.66	*
30	Uveitis (Inflammation of the Uvea)	4.2	*	**67**	Infection	4.55	*
31	Eye Infection or Lens Problems	4.6	*	**68**	Suture Adjustment	4.55	*
32	Definition of Keratoconus	4.3	*	**69**	Transplant Rejection	4.61	*
33	Causes of Keratoconus	4.3	*	**70**	Corneal Graft Clouding and Edema	4.61	*
34	Symptoms of Keratoconus	4.3	*	**71**	Neovascularization: Risk of New Vessels Around Graft	4.3	*
35	Complications of Keratoconus	4.5	*	**72**	Increased Intraocular Pressure	4.5	*
36	Diagnosis of Keratoconus	4.3	*	**73**	Hemorrhage	4.4	*
37	Treatment of Keratoconus	4.2	*	**74**	Lens Clouding	4.3	*
				75	Retinal Detachment, where the back inner layer of the eye detaches from its normal position	4.3	*

Regarding the clinical data elements (Table 2), as shown in the table, the data elements that scored above 3.5 were selected as essential data elements. The data elements of familiarity with nystagmus, familiarity with eye twitching or nervous tic, anterior lamellar corneal transplantation, automated therapeutic lamellar corneal transplantation, full-thickness anterior corneal transplantation, deep anterior lamellar corneal transplantation, posterior lamellar corneal transplantation, endothelial lamellar corneal transplantation, automated delaminated lamellar corneal transplantation, Descemet membrane endothelial corneal transplantation, and limbal cell transplantation, with an average score between 2.5 and 3.5, were determined as optional data.

TABLE III. AVERAGE SCORES ASSIGNED TO EDUCATIONAL DATA ELEMENTS BY SPECIALISTS

Number	Data Elements	Average Score	Essential Data Elements	Number	Data Elements	Average Score	Essential Data Elements
1	Hygiene at the Surgical Site	4.7	*	**24**	Use of Lenses	4.7	*
2	Bathing Instructions	4.4	*	**25**	Use of Prayer Mat (Mahrab) during Prayers	3.6	*
3	Use of Eye Protection while Bathing	4.3	*	**26**	Proper Posture during Prostration (Sujood)	3.6	*
4	Avoidance of Water and Soap in Eyes	4.5	*	**27**	Fiber Intake	4.1	*
5	Washing Hands before Administering Eye Drops	4.7	*	**28**	Fluid Intake	4.1	*
6	Avoiding Eye Rubbing	4.7	*	**29**	Soup Consumption	4	*
7	Use of Eye Protection while Sleeping	4.5	*	**30**	Decreased Vision Compared to Previous Days	4.6	*
8	Sleeping on the Back or Opposite Side	4.3	*	**31**	Eye and Surrounding Pain Not Relieved by Prescribed Painkillers	4.7	*
9	Avoiding Prolonged Bending	3.8	*	**32**	Increased Redness, Swelling, and Eye Discharge	4.6	*
10	Time Required for Sunlight Exposure	3.8	*	**33**	Sudden Onset of Pain Above the Eye Socket and Persistent Headache	4.5	*
11	Reading	3.8	*	**34**	Seeing Colored Halos around Lights	4.5	*

12	Driving	4.3	*	**35**	Fear and Discomfort from Light (Photophobia)	4.5	*
13	Mobile Phone Use	3.7	*	**36**	Sensation of Foreign Body in the Eye	4.6	*
14	Watching Television	3.7	*	**37**	Instructions for Eye Drop Usage	4.7	*
15	Avoiding Lifting Heavy Objects	4.4	*	**38**	Timing of Medication Use	4.7	*
16	Cooking	3.9	*	**39**	Use of Bandage Contact Lens	4.6	*
17	Dusting	4.05	*	**40**	Correct Dosage of Medication	4.5	*
18	Swimming	4.4	*	**41**	Correct Dosage of Eye Drops	4.6	*
19	Heavy Exercise	4.3	*	**42**	Use of Sunglasses	4.1	*
20	Walking	3.4		**43**	Timing and Usage of Eye Shield or Eye Cup	4.4	*
21	Facial Makeup	4.5	*	**44**	Use of Prescription Glasses	3.7	*
22	Eyelash Makeup	4.5	*	**45**	Post-Operative Clinic Visits	4.5	*
23	Use of False Eyelashes	4.5	*	**46**	Frequently Asked Questions about Corneal Transplant	4.3	*

Regarding the minimum educational data (Table 3), almost all experts agreed with the items and gave an average score above 3.5 to the elements, which were determined as essential data elements. Among the educational data elements, only the walking data element, with a score of 3.4, was determined as an optional data element.

TABLE IV. AVERAGE SCORES ASSIGNED TO DEMOGRAPHIC DATA ELEMENTS BY EXPERTS

Number	Data Elements	Average Score	Essential Data Elements	Number	Data Elements	Average Score	Essential Data Elements
1	Ability to Display Data Registration Date	4.45	*	**24**	Ability to Consolidate Records	4.5	*
2	Ability to Display Data Registration Time	4.4	*	**25**	Data Linkage	4.4	*
3	Use of Medication Reminder	4.8	*	**26**	Ability to Set Filters for Each Variable	4.4	*
4	Use of Eye Drop Reminder	4.8	*	**27**	Ability to Set Filters and Defaults for Each Variable	4.1	*
5	Use of Appointment Reminder with Treating Physician	4.5	*	**28**	Use of Algorithms to Identify Events (Case Finding)	4.05	*
6	Ability to Maintain User Profile	4.3	*	**29**	Identification of Cases Based on Inclusion Criteria	4.25	*
7	Ability to Provide Recommendations for Users	4.5	*	**30**	Capability to Present Information in Dashboard Format	4.5	*
8	Capability to Detect Emergency Situations	4.8	*	**31**	Display Information in Map Format	3.95	*
9	Dietary Reminder	4.6	*	**32**	Definition of User Roles for Determining Access Levels for Viewing, Data Entry, Editing, and Auditing	4.20	*
10	Ability to Send Periodic Educational Messages	4.4	*	**33**	Comprehensive Logging of System User Activities (Log File)	4.35	*
11	Display of Previously Registered Patient Data	4.4	*	**34**	Complete Maintenance of System User Activities (Log File)	4.3	*
12	Use of Voice Messaging	4.1	*	**35**	Availability of Help Features for Users	4.45	*
13	Display of Periodic Medication Use as Charts	4	*	**36**	Ability to Perform Automatic Backups from Within the Program	4.35	*
14	Display of Symptom Improvement or Recurrence as Charts	4.5	*	**37**	Support for All Electronic File Formats with Unlimited Capability for Each Record	4.45	*
15	Ability to Receive User Feedback	4.4	*	**38**	Direct Storage of All Electronic File Formats with	4.25	*

					Unlimited Capability for Each Record		
16	Mobile-based Functionality Mobile-based Functionality	4.4	*	**39**	Suitable Interfaces for Data Exchange with the Electronic Health Record System (EHR)	4.2	*
17	Use of Structural Standards in Software Design	4.4	*	**40**	Boolean (AND/OR) Advanced Search Functionality	4.05	*
18	Use of Content Standards in Software Design	4.4	*	**41**	Hierarchical (Progressive) Search	4	*
19	Use of Vocabulary Standards in Software Design	4.3	*	**42**	Historical Range Search	4.25	*
20	Use of Messaging Standards in Software Design	4.4	*	**43**	Ability to Reorganize Search Results	4.1	*
21	Use of Information Confidentiality Standards in Software Design	4.5	*	**44**	Saving Search Results in Standard Formats Including XLS, HTML, PDF, and XML	4.1	*
22	Use of Information Security Standards in Software Design	4.6	*	**45**	Saving Various Reporting Conditions for Periodic Reports	4.05	*
23	Ability to Identify Duplicate Patients	4.5	*	**46**	Support for Various Tools for Specific Statistical/Analytical Methods (Index Calculation)	4.35	*

Additionally, based on the experts' opinion, all technical capabilities and functional requirements of the educational system (Table 4) were deemed essential.

DISCUSSION

In a study conducted by Ghazi Saeedi and colleagues titled "Determining the Information Elements and Minimum Data Set Required to Create a Web-Based Electronic Health Record for Glaucoma Patients," it was found that in the needs assessment, all identity information fields including name, surname, father's name, national ID number, age, gender, address, phone number, and patient admission number were considered essential. For the minimum clinical data, eye structure, lens, intraocular pressure, and alignment were identified as necessary. Additionally, for the minimum historical data of the patient, blood pressure, blood sugar, ischemic heart diseases, asthma, hyperlipidemia, kidney diseases, medication history, family history, other eye diseases, chief complaints, and performed surgeries were deemed essential (15).

In the present study, aside from the importance of the mentioned items and the selection of some of them for the minimum data set, other factors such as familiarity with eye diseases, corneal transplantation, and its complications, educational information, and more extensive identity and clinical data were considered significant. Moreover, in addition to the

aforementioned items, other data in the identity section, such as social and economic information, caregiver information, personal habits, disease history, and also educational information related to corneal transplantation and self-care, which were deemed necessary by specialists, were added.

Shahbazi and colleagues, in a study titled "Determining the Minimum Data Set for the Electronic Health Records of Uveitis Patients in Iran," identified the essential minimum content for the electronic health records of uveitis patients, which includes demographic information (for identification and follow-up), clinical information, paraclinical information (imaging, laboratory data), overall clinical assessment (including diagnosis and disease progression), clinical recommendations, and finally, information related to individuals involved in the treatment and follow-up process (physicians). The demographic information includes the patient's name and surname, hospital record number, age, gender, national ID number, city of residence, province of residence, and examination date. The clinical and paraclinical data section includes the chief complaint, comorbidities, medication history, surgical history, evaluation of different parts of the eye, imaging assessment results, test results, overall assessment, treatment plan including laser, medication, and surgery, and the name of the examining physician (22).

Due to the difference in the eye diseases studied in the mentioned study and the present research, the detailed data related to uveitis were removed, and instead, essential data related to corneal transplantation were added.

The comparison of the present study on the minimum data required for designing an educational system for corneal transplantation with the mentioned sources indicates that our findings somewhat align with the data presented in the two recent sources. However, there are differences in certain demographic, clinical, and educational elements, making direct comparison difficult.

In the foreign articles reviewed, no specific study focused on determining the minimum data set for corneal transplantation was found. Most studies were related to the evaluation of self-care programs in ophthalmology, which made comparison impossible. Although some elements mentioned in the above studies were also considered in the present research, since the design of the educational system was based on the needs assessment from specialists and tailored for individuals with corneal transplants, some elements were removed based on expert opinion, and new data were added. Additionally, in identifying the information elements for this study, other similar systems were examined. However, access to the full text of some research was not available, and in the accessible sources, the details of the elements were sometimes not explained, preventing precise comparison.

One of the limitations of this research was the time-consuming nature of completing the questionnaires, as specialists were often too busy to fill them out. This issue was resolved by sending the questionnaire multiple times via email and conducting in-person follow-ups with the specialists.

CONCLUSION

Based on the findings of the study, the essential informational elements for the educational system designed for individuals with corneal transplants were identified as follows:

- Demographic Section: The necessary information elements were categorized into five domains:
  1. Identity Information: 7 items
  2. Socio-economic Information: 5 items
  3. Caregiver Information: 6 items
  4. Personal Habits: 5 items
  5. Medical History: 6 items
- Clinical Section: The informational elements were identified across eight domains:
  1. Understanding Eye Structure: 1 item
  2. Familiarity with Eye Diseases: 30 items
  3. Keratoconus: 6 items
  4. Corneal Transplantation: 4 items
  5. Causes of Corneal Transplantation: 10 items
  6. Types of Transplant Methods: 11 items
  7. Corneal Transplant Rejection: 4 items
  8. Post-Transplant Complications: 9 items
- Educational Section: The educational information elements were identified in 10 domains:
  1. Hygiene Practices: 6 items
  2. Daily Activities: 11 items
  3. Types of Sports: 3 items
  4. Personal Grooming: 4 items
  5. Religious Practices: 2 items
  6. Diet: 3 items
  7. Normal and Abnormal Postoperative Symptoms: 7 items
  8. Medication Management and Actions: 8 items
  9. Postoperative Follow-up: 1 item
  10. Frequently Asked Questions about Corneal Transplantation
- Technical Section: The informational elements for functional requirements and technical capabilities were identified in two domains:
  1. Functional Requirements: 15 items
  2. Technical Capabilities: 31 items

Data requirements are a standard tool for data collection and ensuring access to data with complete accuracy and precision. Determining the minimum data set is one of the initial steps in developing any information system, as it essentially defines the information needs of the end users. Information systems must also possess a series of features and technical capabilities to meet users' needs. In this study, the data requirements and technical capabilities necessary for designing and creating a mobile-based self-management educational system were fundamentally identified across four sections: demographic, clinical, educational, and technical, to support the self-management of individuals with corneal transplants.

Using this system improves patients' self-management skills and facilitates their communication with healthcare providers. To the best of the authors' knowledge, no research has yet been conducted to determine the minimum data set for an educational system specifically for individuals with corneal transplants. However, similar studies have been carried out on related topics.

Based on the findings of this research, from the perspective of users, the most important data elements for a corneal transplant self-care educational system include demographic information, clinical information, educational information, functional requirements, and

technical capabilities. These data elements are essential for developing a self-care educational system for individuals with corneal transplants. Therefore, developers of self-care educational systems can utilize these findings to move towards creating a high-quality, educational, and practical program.

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CONTRIBUTORSHIP STATEMENT

All authors reviewed and commented on the manuscript, as well as all are responsible for the content of the manuscript.

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DATA AVAILABILITY STATEMENTS

The data will be made available from the corresponding author on reasonable request.

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