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Anxiety of Patients in the Waiting Room of the Emergency Department

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ABSTRACT

This study aims at understanding the patient's experience in the waiting room of the emergency department. The research explores and unveils the context and interactions in the waiting room and the factors that cause anxiety. As a result, a service that helps patients moderate anxiety has been developed.

For the research, 12 patients and their family members were observed, and an interview with the head of the department was conducted. These methods were used to answer the following research questions: How do people experience the waiting room in the emergency department? How can the negative aspects be relieved?

The main findings of this study reveal distrust between the patients and staff of the hospital, the patients' consistent focus on their status, and an uncertainty about the waiting time. The focus of this study is on alleviating these negative aspects by enabling patients to acquire sufficient information about the procedure and the waiting time.

ACM Classification Keywords

H.5.2. User Interfaces: User-centered design, evaluation/ methodology, H.5.m. Information interfaces and presentation

General Terms

Design, Human Factors

Author Keywords

Anxiety, emergency department, hospital, patients, waiting

INTRODUCTION

At some time it might happen that you will have an accident for which you need to go to the emergency department (ED); for example, if you fall and get hurt, if you break your arm, or if you accidentally cut yourself. In the waiting room you might be conscious about your pain,

while focusing on the wounded area, and you might feel anxious and nervous about what the doctor will do or say. Khilgren showed that although the majority of people had a positive attitude toward the medical care received, many negative emotions were present in the emergency department [1]. People in waiting rooms describe feeling numb, hoping for improvement, being afraid, having no control, walking around like a robot, and feeling powerless [2]. Muller-Staub et al. showed that anxiety, insecurity, nausea, thirst, and hunger were not detected well by nurses [3]. This illustrates that the hospital staff as observers fail to notice various states and emotions of patients and, as a result, they do not offer appropriate and timely patient care, because these problems are not easily detectable. According to Edwin D. Boudreaux and Erin L. O'Hea, there should be some intervention to improve the waiting experience. Promising interventions include providing information on how the ED functions through visual media, improving ED processes, and improving the interpersonal skills of providers [4].

This paper focuses on the anxiety aspects of waiting in the ED. To investigate this, 12 patients and accompanying family members in the waiting room of the ED were observed. Additionally, an interview with the head of the department was conducted at Leids Universitair Medisch Centrum in Leiden, the Netherlands. Based on the research findings, a service concept that resolves negative aspects in the waiting room in the ED is proposed. It is hoped that through understanding the individual's experiences and the viewpoints of the hospital staff, the research can be used as a guide in the research of health care and design practices.

APPROACH

This study is divided into three stages: research and analysis, research findings, and design.

In the research phase, people in the waiting room were observed and shadowed; features of the environment were investigated, and the interview with the head of the emergency department was conducted. After the analysis of the research, the problems that patients encountered in the waiting experience were extracted, and these elements were visually represented as an interaction map.

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Figure 1. Patients in waiting room of emergency department. Diverse aspects of waiting experience were captured through the observational research.

Finally, among the problems found, the most prominent ones were selected to be solved, and a service concept was generated. The aim of the concept development is to demonstrate how negative experiences can be decreased and how positive feelings can be maintained by enhancing the interactions among patients and the hospital staff.

Research goal and phenomena

The goal of this study is to explore people's anxiety and their overall experience while waiting in the emergency department and to determine the factors that cause or alleviate anxiety. In this research, the following phenomena are investigated: the environmental conditions (layout, installed objects, crowdedness) affecting patients' behavior, feelings, and thoughts; the interrelationship between waiting time and its influence on patients' behavior, feelings, and thoughts; the availability or absence of distractions affecting patients' attention and mood; patients' main feelings during waiting; and the relationship between the patient and staff affecting patient's behavior, feelings, and thoughts. These phenomena can be characterized as interactions among patients, among patients and the environment, and among patients and the staff.

Research questions

As previously indicated, the research questions are established to reach the research goal. The main focus is on how people experience the waiting room in the emergency department and how anxiety can be decreased.

For this, five sub-questions are set:

- What are the feelings of people in a hospital waiting room?
- What are the thoughts of people in a hospital waiting room?
- How do people perceive the hospital waiting room and the other people in the waiting room?
- What elements of the waiting room affect anxiety?
- What behaviors do patients show while waiting?

The end goal is to decrease anxiety by changing the interaction among patients, the environment, and the staff. By knowing how patients feel about and perceive the waiting room or the staff and how they behave, it will be possible to think of solutions that change overall experiences in a waiting room.

METHODS AND PROCEDURES

In order to understand the overall context and people's interactions, field observation and expert interviews were conducted. The selection of these methods was determined considering research challenges within the hospital, including the legal regulations of physically and emotionally sensitive patients and their privacy protection. For field observation, patient observation and environmental analysis were conducted in parallel. An interview with a triage doctor followed the field observation. Triage is an assignment of degrees of urgency to wounds or illnesses to decide the order of treatment of a large number of patients or casualties [5].

Field observation

Patients and the environment of the waiting room were observed and analyzed to figure out the patients' experience and to understand their practical and emotional needs related to anxiety while they waited for treatment and information about their injuries. Environmental factors found in the literature were incorporated for environmental analysis.

Patient observation

Twelve patients and accompanying people in the waiting room of the ED were observed under the permission of the hospital authority of Leids Universitair Medisch Centrum in Leiden, the Netherlands (See Figure 1). However, talking with people was not allowed and only observation was permitted to protect the patients' privacy and to not interrupt them. The observations were conducted twice to gain information on a broader range of patients and their behavior. All the observed people vary in age and gender because any person could be one who experiences the waiting room of the ED in reality. Therefore the people are chosen randomly. Though, one condition was taken into consideration. Although more than twelve patients were observed, some patients who left the waiting room in a short time (around 10 minutes) were excluded for reliable

research results because it is too short to examine diverse behaviors and their purpose of visit might be irrelevant to an emergency treatment. To avoid inappropriate generalizations and interpretations of certain behavior and its meaning, patients' similar activities found during the first and the second observations were compared in the analysis process.

Patients and their family members were observed while waiting for the results of their check-up. The observation was unobtrusive and the goal was to gather actual information of the whole experience, while not affecting people's behavior. In the process of observation, patients and their families' interactions including people, personal belongings, and their mood changes were documented (See Figure 2).

After the observation, the raw data depicting the experience on observation sheets were reorganized to elicit meaningful phenomena related to the increase and decrease of patients' anxiety. Patients' interactions were made into sub-themes according to the commonalities.

Although it was not possible to ask patients direct questions or to encourage them to participate due to the regulations, substantial phenomena were captured from the shadowing of the people. Additionally, listening to conversations among patients, staff, and accompanying people gave insight into understanding the unconscious demands of patients and the driving forces that yielded stressful moments. The findings are introduced in the next section.

Environment observation

The environment of the waiting room was analyzed to probe the interrelationship among people, the interior, and the installed objects. First, all objects and the characteristics of each item, such as the layout of chairs, signage, lighting, wall color, installed screens, and so on were documented in detail. Next, the patients' interaction with those items was focused on. To measure the effectiveness of current environmental attributes and to recognize the influence of environment on patients, the location of the objects, the patients' accessibility to the facilities, the frequency of use, and the people's reactions were examined. This information was then organized to illustrate the functions of the elements that were related to patients' anxiety. The criteria of measuring environmental attributes are as follows.

- Elements that make patients recognize the processes of the waiting room
- Elements that affect the atmosphere of the waiting room

Expert interview

To gain in-depth background knowledge about the procedures, the visions, and the experience of the staff of the hospital, an open interview was conducted with the head of the emergency department. The interviewee was a doctor in charge of the triage system, the process of assigning

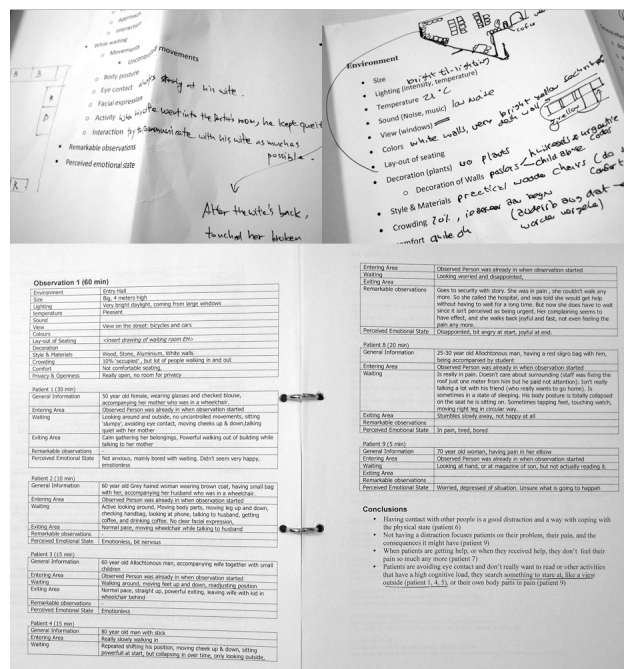


Figure 2. Example of observation documents and reorganized raw data for the analysis

priorities for medical treatment at the Leids Universitair Medisch Centrum (LUMC). The findings from the interview follow.

Procedure & experience

In emergency departments, patients are helped in order

Color codes	Degree of urgency
Red	The patients in critical condition are immediately helped and not seen in a waiting room.
Orange	The patients are in serious condition but are not required immediate care. They get medical evacuation after all 'Red' patients have been transported. They get help within ten minutes.
Green	The patients are in stable condition but require medical assistance. He/ she gets medical care after all immediate and delayed people have been evacuated.
Blue	The patients' injuries are not serious enough to get urgent medical care in the ER (they can wait a week). They could also just visit a general practitioner.

Table 1. Color codes of the triage-system

The triage-system is the policy that judges degrees of urgency.

according to the seriousness of their injuries. This is done by a doctor who first judges the injury. This triage system utilizes color codes for different levels of urgency (red, orange, yellow, green, and blue). The patients are seen in a room, and the color code and the reasons for waiting are explained to them. They then receive a note with some explanation and their code (Table. 1 shows the color codes of the triage system). This should decrease anxiety, by indicating that their color could have been worse; they could have had a more urgent need. They are asked if they want something to relieve the pain, and, if necessary, some basic treatments are offered such as a compress on a painful ankle.

After the triage test, the patient has to wait and is not informed further. However, he or she knows approximately how long the wait will be, and it usually takes less time. No one is allowed to eat or drink. Sometimes patients bring a lot of people with them, including children, but they are actually only allowed to bring two people.

Few patients appeared anxious, but some might be so because their injury and visit are unexpected and a lot of things are happening in a short time. However, since everyone has already been seen by a doctor, there should not be a reason to be anxious.

There is a lot of time to think, but there are magazines, a screen that shows information, and televisions, which are turned on in the evening.

People don't want to wait; they think their own problem is the most serious, but it is explained to them that other cases are more urgent. They usually expect to be put in front of the waiting line. Patients usually want to be helped and get home as fast as possible, but the staff does not feel any sympathy for this kind of practical issue.

Environment

In the Emergency Department there are rules to what the environment should be like:

- No Latex can be used because it is highly flammable material and emits harmful gas.
- TV is turned on only in the evening, so that the waiting area is quiet during daytime.
- Although some fragrances help people relieve the stress, it is not allowed to use in the ED. Some patients who have low resistance to a certain flavor (cancer patients getting therapy) might be allergic to it.
- Everything must be easy to clean and hygienic.

RESEARCH FINDINGS

Field observation

Patient observation

As a result of the analysis of observation, three important groups were discovered that affect concerns and responses of patient; Fear, uncertainty and confusion, and annoyance.

Fear

Patients anxiously looked at their injuries frequently with many concerns because they did not know whether they are safe enough and why tests were done, what will be happened next, or whom they should talk to. Family members of a patient tried to reassure the patient. But the information about what is helpful to get better was not provided.

Uncertainty and confusion

People do not know when they are going to be helped. They are continuously in a state of awareness to get information about how long they have to stay in waiting room and how the staffs of hospital can find them. Although the size of waiting room is large enough, patients typically tend to sit in front of the door because they want to be more visible to staffs and not want to be forgotten.

Annoyance

Patients think that they are sick enough and have higher priority over other patients in the queue. When there is a gap between their thinking and the judgment of staff of hospital, they complain and have doubts about the system of the ED. Since they were not informed well about what steps were going to occur during their treatment, they annoyed questioning, "Is everything going on according to the schedule?"

Environment analysis

After the observations of environmental factors and their functions two categories that affect the experience of patients were made. And elements of them are listed and measured.

Elements that make patients recognize the system of waiting room for themselves:

The informative facilities like signage and procedure guidance were not enough and placed on inappropriate areas. If patients do not contact the staff in person, they would not obtain information that is related to their process in the waiting room. There were no installed instructions that can help patients understand the system of the hospital. Signage was not explicit to let patients know whether they were in right place for treatment and whom they had to contact. Consequently uncertainty makes patients confuse and lose a sense of management.

Elements that affect to atmosphere of waiting room:

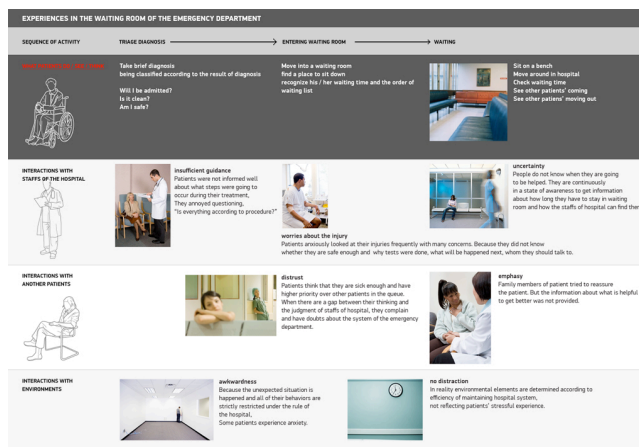


Figure 3. The image of the interaction map

The waiting area did not have windows with an outdoor view. The layout provided no privacy, nor did it encourage social interactions. No distractions were available other than magazines; the televisions and information screen were turned off. This gave the waiting area a closed, isolated, and empty character.

Interview

Feelings of people waiting in a hospital waiting room

Because of the unexpected situation of the patients being in the ED and the strict restrictions of behavior enforced by the hospital rules, some patients experienced anxiety.

How people perceive the hospital waiting room and the staff

Patients had doubts about the triage, which determined the order of treatment. Although the judgment is based on a system, the patients often do not trust this. They think their injury or illness is more urgent than others with the same or higher urgency.

Elements of the waiting room that cause, increase, decrease, or prevent anxiety

Hospital staff think that the waiting phase is less important to patients and do not pay a lot of attention to it; they do not



Figure 4. The representative image of the service concept

see it as a part of their job. This lack of interaction affects the patients' level of anxiety. The uncertainty as to when they will receive medical care causes uninterrupted awareness among the visitors, which likely increases the anxiety.

Basic components of waiting experience

The raw data acquired from the research were clustered according to similarities. (The raw data includes all of the recorded interviews and documented people's behaviors). Subsequently, the reorganized data were made into an interaction map to identify the basic components of the waiting experience (See Figure 3). The identified major components were the patient, another patient, hospital staff, and the environmental elements of the waiting room. The goal in creating the interaction map was to make a map that indicated how the basic components of the system interacted with one another and which kinds of information are being circulated among the components [6]. It is helpful in visualizing the context of the waiting room and the prominent problems that negatively influence the patients' experience.

The interaction map unveils some problem areas that are relevant to the origin of the anxiety. The problems chosen for discussion are a feeling of uncertainty, confusion of procedure, and distrust of the hospital staff.

DESIGN

Perceived waiting times are more closely associated with patients' satisfaction than actual waiting times [4]. People in waiting rooms expect information, assurance, support, and comfort from professionals who provide equitable and respectful care [7, 8]. Because the problems and maintenance systems cause patients to perceive the waiting time as obscure and confusing, negative feelings result. Therefore, the focal point of the design concept is given to enhancement of waiting time management.

Information service in the waiting room of emergency department

The concept of service aims at notifying the patient of the waiting time and the order in which the patients will be seen. Due to the uncertainty of the waiting time and order, patients try to obtain this information from the staff, and this causes tension. To moderate these anxieties and to enable patients to relax, an interactive information service is proposed (refer to the scenario movie on the Internet. The URL is <http://vimeo.com/3056569>). The service concept is as follows.

After triage, the patient selects a character that represents him or her (For a patient who is in critical condition, the character is automatically assigned by the hospital staff). Then the information of the patient's profile and the triage test result with the chosen character is registered in the database of waiting room management system. Subsequently, a wristlet is printed. On the front side, there

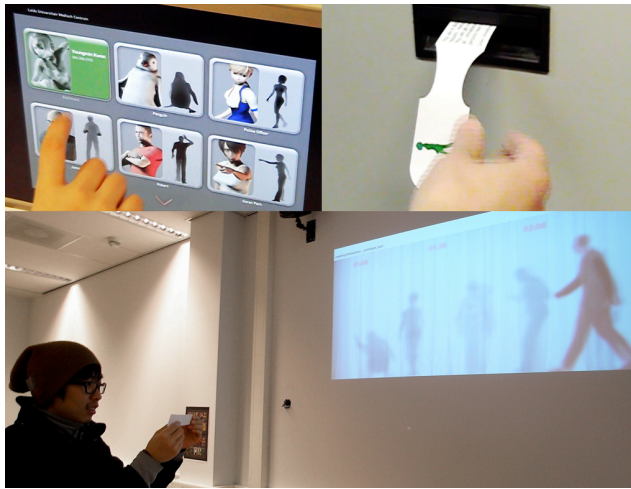


Figure 5. The images of the prototype

is a character that indicates the patient, registered information, and the policy of the ED (See Figure 5).

Next the silhouette of the character is projected on the wall in the waiting room. The character represents the patient and he or she stands in a waiting line with other silhouettes. An estimated waiting time is indicated for each silhouette. For example, if a patient is classified as green in the triage test and designated a “penguin” as her character, a wristlet that has the image of the penguin and some instructions will be given to her. The penguin silhouette will be indicated on the wall with other patients’ silhouettes. As time goes by, the characters in the line move forward, so that the patient can figure out when her turn will be and how many people are ahead of her.

Silhouettes move forward in the queue, and sometimes interact with each other. Silhouettes show expressive gestures such as shaking hands, dancing, talking and so on. Patients become curious about other characters’ owners, and this distracts the patients from their stress.

When an urgent patient appears, a red-colored silhouette is indicated on the wall, and other patients are willing to give way to a new patient’s silhouette. Patients in the waiting room can see temporal change of the queue, and anticipated waiting time for each patient is rearranged.

Given knowledge of the waiting time, patients can be more relaxed without questioning staff. Additionally, they can move around outside the waiting room if they have enough time.

To sum up, the patients produce their own forms of embodied information including their profile, the result of triage test and the policy of the ED and it is visually represented in the space. It creates an informative environment through ambient visualization that reflects the number and the order of waiting people in real time (See figure 6).

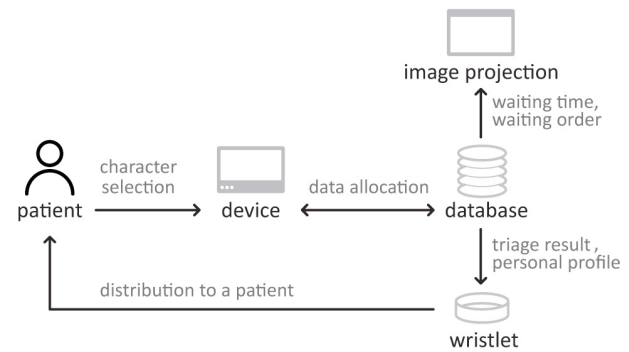


Figure 6. Product-service system map

Evaluation of the concept

An evaluation study was conducted to observe users’ actual interaction after creating the scenario and a prototype. The aim of the evaluation of the concept is to determine if people in the waiting room could actually avoid anxiety and appreciate use of the service.

For evaluation, the main tasks in the scenario were given to five participants who had recently experienced the waiting room of the ED to perform. Through role-playing, the difference between the desired scenario and actual behavior was captured and the reasons for the gap were elicited from retrospective interviews with participants after the observation. Given tasks are as follows.

Selecting the character that represents the patient

Participants were guided to select a character that represents him/her. For this task, the touch screen interface is used. Although participants understood how to use the touch screen at once, they did not realize why they had to select someone and how the service worked for them. The following quotation indicates the common opinion of the participants.

“It is interesting to select someone. But I don’t know what I am doing. Is it good for me?” by H.B Kong

Wearing wristlet

After receiving a wristlet with the imprinted character, participants perceive that the service was not just for fun, but seriously designed. The participants said that wearing a wristlet made them feel as if they were being considered as an important patient.

“When I wore a wristlet, I felt I was registered properly, and I was distinguished from other people in the waiting room.” by H.R Lee

Figuring out the silhouette that is projected on the wall

When several silhouettes were projected on the wall, participants could not figure out their own character at first

viewing. Although they selected the character, they could not draw the silhouette in their mind. There are two probable reasons for this: the images of silhouettes are not indicated on the touch screen interface; and the figures of characters are confusing and not distinct.

Waiting one's turn for treatment

When participants stayed in the waiting area, they tended to stare at the silhouettes on the wall. The movements of the characters and their interaction with other characters triggered their attention. After a couple of minutes, they realized they had enough time, and did not have to wait for the call from the staff. Subsequently, they stopped seeing the wall and started conducting their own business such as moving around the room and making phone calls.

Evaluation results

- Knowing the waiting time and one's turn in line allows people to relax and to get a sense of control over the situation.
- For patients' concrete understanding of the service, an introduction should be given to patients before they encounter the procedure. They would then know what they were doing and how it would help them.
- Participants think the wristlet is the determinant feature that distinguishes them from other people. Wearing the wristlet makes participants feel that they are being considered as important patients. A wristlet would be an effective means of conveying messages or instructions to patients.
- It is not easy to match the image of the character with the silhouette that is projected on the wall. Participants cannot draw the exact shape of silhouettes in their mind. For this problem, the character and its silhouettes should be shown on the touch screen interface, and the shape of the character needs to be unique to be explicitly distinguished.
- The silhouettes' interactions have the effect of distraction.

CONCLUSION

To explore the waiting experience in the hospital ED, environmental factors, patient behavior, and the staff perspective were explored during the research. Although the staff thinks the current system for the ED could reassure the patients, it turns out that the perceived experience of the patients does not match the viewpoint of the hospital staff.

Patients' uncertainty and confusion about the procedure of treatment, the time they have to wait, and patients' perception of distance to the staff of hospital yield distrust in the system. Uncertainty about when they will receive treatment and the fear that they might miss their turn place them in a state of continuous awareness. All of these

aspects are related to the anxious feelings of patients in the waiting area.

The topics of conversation in the waiting area indicate that their injuries and illnesses are the patients' main concern while waiting. Although patients want to be informed, the staff does not perceive this as part of their job. Sharing opinions about their injuries and making conversations made the patients feel more at ease. After receiving attention from the doctors, the stress also seemed to be relieved.

Although interactions with other people and reading books have an effect of distraction that could indirectly moderate the anxiety, patients are less interested in doing something that requires high cognitive attention and fine motor skills.

Through usage of the information service, the possibilities and opportunities to decrease negative aspects were demonstrated. The validity of the new concept has been examined through the evaluation and results indicated the effectiveness and added value of this procedure. Positive aspects of this system include accessibility to information, being identified as a patient, and having distractions. However, some usability problems were discovered during the test. For implementation of the concept, the flow of the service has to be more intuitive, so that people would be able to use the service without supplementary instructions. Changes to the ED process should be minimal, compared to the current archetypal system, as learning the usage of the service might be confusing for the patients.

DISCUSSION AND FUTURE ACTIVITY

This research was conducted in a series of efforts to accommodate people in several phases of experience in a waiting room of a hospital. This system has indicated positive effects in unveiling all the physical and emotional implications in terms of interactions among patients, staff, and the environment.

The results of this research show causal elements that cause patients to encounter emotional frustration while waiting in the ED. A service concept has been proposed as a solution. Through this research, it is hoped that the findings can be applied to further research as a guide, and more attention will be given to improvement of the quality of care for people in the ED.

Although the research shows many links between patients' desire and their activities, certain aspects of the research could be influenced by the performance in a rather unnatural way. Because direct contact with the patients was not allowed due to the policy of the hospital maintenance, observations of the patients' non-verbal activities are based on interpretation. Due to these constraints, individuals' tacit and potential thoughts were not studied deeply enough. And during the steps of development and evaluation of the new service concept, only patients' perspectives were examined not considering how hospital staff perceives it. For an

improved direction and further research, cooperation with hospital staff, and accessibility to patients are critically needed to obtain a wider range of insight.

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