Factors Influencing the Sustainability of Stroke Rehabilitation Services in Community: An Analysis Based on Kano Model

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Abstract: A patient’s enthusiasm will affect their recovery during stroke rehabilitation training. Since rehabilitation training is a long process, patients are usually cared for at home, especially during the COVID-19 pandemic. However, professional supervision in the community is often lacking, resulting in low patient participation and initiative as well as the low sustainability of rehabilitation services. At present, many researchers are trying to optimize the process of community rehabilitation services to improve patient compliance. The majority of them, however, have failed to fully consider the psychological needs of the patients. Our aim was to find the key factors affecting patients’ enthusiasm to participate in rehabilitation training. We also wanted to provide an optimal scheme for enhancing the sustainability of community rehabilitation services. Based on patient-centered research, we applied the Kano model and the customer satisfaction coefficient to the study and established a framework for improving the community rehabilitation experience. We observed that patients must first understand basic rehabilitation information and effective rehabilitation methods. Additionally, we found that some factors related to incentive and pleasure could meet the psychological needs of patients. Furthermore, as a result of this research, we applied the framework in practice and refined the design of a rehabilitation-training service system. This work may have significance for the design of sustainable community rehabilitation services. The purpose of this paper is to indicate the direction of rehabilitation services so that patients can take the initiative in rehabilitation.

Keywords: rehabilitation service; sustainability of rehabilitation; Kano model; user satisfaction

1. Introduction

A stroke is an acute cerebrovascular disease with a high incidence and disability rate [1]. About 50–80% of patients who survived after rescue will have varying degrees of disability [2]. Motor dysfunction, dysphagia, cognitive dysfunction, and other symptoms can affect patients physiologically and psychologically, seriously hinder their daily activities, reduce their ability to live independently or participate in social interactions, and cause negative emotions such as depression, anxiety, and inferiority [3]. Rehabilitation training can shorten the period of convalescence, help patients to achieve self-care and return to society, and reduce their potential burden [4,5]. However, rehabilitation is a long process, and patients often need to continue treatment in the community and at home after discharge. The need for community rehabilitation services is essential, especially in recent years, as the COVID-19 pandemic has further increased the demand for community health services. However, these treatments are often administered without professional supervision, leading to problems regarding sustainability [6]. Patients in the community often lack the initiative and enthusiasm to participate in rehabilitation training. After discharge, many patients slow down their rehabilitation training so that the rehabilitation cycle is prolonged. This leads us to think about the optimization of community rehabilitation services. Rehabilitation services should mobilize the participation and enthusiasm of patients to further improve the benefits of rehabilitation [7].
The existing research is usually based on the experience of therapists [7–9]. It has analyzed how to establish plans for different patients in the community and have proven some effective and reliable approaches. These studies provide guidance for therapists and nurses to clarify the help they need to provide in the community. Although the rehabilitation methods in the current study are theoretically feasible, they are still difficult to implement. These methods are often poorly structured and do not work consistently over long rehabilitation cycles. In addition, in the routine rehabilitation process, the psychological needs of patients are usually not emphasized, and they usually passively accept the treatment options suggested by therapists. Subjective factors will greatly affect the patients’ emotions during rehabilitation training [9,10]. In addition, negative emotions are an important cause of poor compliance in the community. Rehabilitation services need to be patient-centered and account for patients’ needs. We aim to optimize rehabilitation services to improve engagement by patients, which may help in maintaining their motivation to complete rehabilitation training in a community environment without supervision [11].

Different factors have different degrees of influence on patients’ enthusiasm. Therefore, in order to evaluate and measure the key factors affecting the enthusiasm of patients for rehabilitation services, we introduced the Kano model approach in the study [12–14]. Kano model can divide service quality attributes into five dimensions according to user satisfaction, which plays an important role in the research of service optimization direction [15]. The Kano model approach helps us define development strategies in more detail because it allows us to see users’ attitudes toward different services or functions and understand the role of different factors in improving user experience. Kano model can effectively analyze the influence of different factors on improving the enthusiasm of patients so that we can understand how to configure these factors.

In this study, we focused on the psychological needs of patients and explored the factors influencing patients’ initiative in community rehabilitation services. This study is conducted based on the Kano model approach. We performed the following steps: an investigation, induction, questionnaire collection, and data analysis. Based on the user-centric concept, we first identified the characteristics of stroke patients in the community. We conducted field interviews with stroke patients and rehabilitation physicians and sorted out relevant studies, so as to analyze the factors affecting the enthusiasm for community rehabilitation training. Through the induction and hypothesis steps, we classified the influential factors according to their characteristics, preliminarily judge their attributes, and establish a mapping relationship via the Kano model. In the validation stage, we collected data through the Kano questionnaire to verify the hypothesis. Finally, we apply the results in practice and transform them into ideas for community rehabilitation service optimization.

In this research, we explore a method for optimizing rehabilitation services in the community. The main contributions of this work are as follows:
1. Using the Kano model, we analyze the factors that play a role in motivating rehabilitation patients in the community;
2. By classifying the factors, we provide a framework to distinguish the roles of different elements and point out the problems that need to be solved in current community-based rehabilitation services;
3. We identify a design scheme that is more suitable for a community rehabilitation environment and is based on patients’ individualized requirements.

We expect that by optimizing the community rehabilitation experience, patients can participate in community rehabilitation training more actively so that the treatment after discharge can be guaranteed. In addition, the Kano model can also be used to evaluate rehabilitation services and provide suggestions for improvement.
2. Literature Review

2.1. Patient-Centered Community Stroke Rehabilitation

At present, the main principle of stroke rehabilitation therapy is to use the plasticity of the brain. Normal motor patterns can be reconstructed by promoting the control of the upper central motion. This plasticity requires purposeful, repetitive exercise, which means patients need to relearn and practice some basic motor skills. This kind of tedious repetition is even more difficult to sustain in community rehabilitation. The current rehabilitation treatments often provide a set of basic rehabilitation methods and related suggestions, lacking consideration of the patients’ emotional needs. Therefore, to improve the quality of rehabilitation services, the concept of a “patient-centered” approach should be included [15–17]. The concept aims to pay attention to the patient’s experience and psychological emotions in the process of medical care so that the patients can be respected and receive treatment more actively [16,18]. Naughton’s research suggests that therapists and patients can reach a common understanding of treatment issues by establishing a good relationship [19]. The study of Hashim et al. suggested that community health care workers should enhance their patient-centered communication skills and literacy to revitalize their services and roles [20,21]. These studies fully demonstrate the importance of the concept of patient-centered treatment. In this research, through visits and surveys, we analyzed patients’ psychological statuses and optimized community rehabilitation services from the perspective of patients. Patient-centered thinking increases the ease with which a given service is accepted by patients. At the same time, it can fully mobilize the initiative of patients.

2.2. The Kano Model

The Kano model approach can help us judge the influence of different design factors on improving patients’ enthusiasm. The Kano model is an effective way to measure user satisfaction. It can distinguish the attributes of each factor, and measure the roles they play in promoting satisfaction [22]. The Kano model divides factors into five attributes: an Indifferent quality, a Must-be quality, a One-dimensional quality, an Attractive quality, and a Reverse quality (Figure 1).

Figure 1. Kano model diagram.
Indifferent quality (I): Whether the factors in this attribute are satisfied has little effect on user satisfaction.

Must-be quality (M): The factors of this attribute are the basic standard to ensure user satisfaction. When these factors are satisfied, user satisfaction will not be improved, but when they are not satisfied, user satisfaction will decrease.

One-dimensional quality (O): These are factors that users expect. The degree of satisfaction of these factors is directly proportional to user acceptance. When these elements are satisfied, user acceptance will be higher; otherwise, user acceptance will decline.

Attractive quality (A): The factors of this attribute concern the enhancement of the attractiveness of the elements; when such elements are not provided, user satisfaction will not be affected. When this element is satisfied, it can greatly improve user satisfaction.

Reverse quality (R): These are the factors that enhance the appeal. Without this element, user satisfaction will not be affected. However, when these elements are in place, they can greatly improve user satisfaction.

Researchers can obtain attributes of different elements through questionnaires, determining priorities, and finding key points for service and product optimization. The Kano model approach has been widely used in various studies. Shin et al. used the Kano model to evaluate the service quality and satisfaction of driving products and proposed a framework to improve the future car-driving service experience [23]. Xie et al. analyzed the different factors that affect the acceptance of hotel robots through the Kano model approach [24]. This study attempts to introduce the Kano model approach into community rehabilitation, analyze the factors affecting patients’ initiative, and propose a new rehabilitation service framework.

3. Materials and Methods

3.1. Target Users

3.1.1. Age Range

Age has an important influence on patients’ physiological and psychological states. Analyzing patients’ needs based on age characteristics can help us better understand patients’ intentions. Stroke patients have obvious age characteristics. The prevalence is higher in people aged over 50 [25]. With the increase in age, degenerative changes occur in the blood vessel walls, especially in the form of arteriosclerosis, which is the pathological basis of a stroke. Chronic diseases such as hypertension and heart disease in old age increase the risk of stroke. In addition, older patients have a variety of complications and sometimes cognitive dysfunction after stroke due to their physical aging. Their recovery is slower, treatment is less effective, and they need more supervision than younger patients.

3.1.2. Intervention Timing

Rehabilitation services provided in the community should be tailored to the patient’s rehabilitation status. Ideally, patients are usually treated in a hospital and then transferred to the community, where their lives are out of danger and some degree of functional recovery has been achieved. Therefore, community rehabilitation should be aimed at promoting active movement.

3.1.3. Scenarios

There are many factors in the community rehabilitation environment that affect the initiative of patients. There is often less supervision, fewer facilities, and fewer professionals in the community than in hospitals or rehabilitation centers [26]. However, at the same time, the community gives patients greater autonomy in social activities, and patients are more connected with each other. In this case, we should consider patient compliance while also highlighting the sociality of rehabilitation services, so that patients can further participate in social communication activities.
3.2. Investigation Process

3.2.1. Field Visits and Literature Research

First, we interviewed 15 patients, all aged between 50 and 65 years. They had all received 3 or more months of rehabilitation training in the community. We collected information about the interviewees’ motivation, attitudes, and feelings through online and offline interviews. At the same time, we also interviewed rehabilitation therapists in the community to learn about their nursing processes and rehabilitation needs. We learned that many patients described feelings of helplessness due to ignorance of nursing knowledge and rehabilitation methods, and therapists emphasized to us the importance of properly planning rehabilitation programs. In addition, many patients who are unwilling to take the initiative to participate in rehabilitation training complained to us that the treatment has little effect, that they lack confidence in it, and feel that all efforts are futile. We also found positive aspects in our visits. Some patients have stronger self-regulatory abilities, and they provide some effective ways to regulate their emotions, such as sharing the experience with other patients or establishing communication groups, which promote mutual supervision among patients in the community. Some patients use journaling to motivate themselves, and therapists have confirmed its positive effect on emotional recovery.

On the other hand, we reviewed the literature, collated existing studies, and identified emerging therapies that could improve patient motivation. Existing studies have fully confirmed that serious games can be deeply involved in stroke rehabilitation training. Games are often task-oriented and can stimulate patients’ interest and enhance their sense of participation [27–29]. Setting effective goals is also considered essential for improving patient performance. The study by Sugavanam et al. emphasized that therapists should communicate and cooperate with patients in setting goals, which can improve patients’ participation and initiative to achieve goals [30].

3.2.2. Induction and Hypothesis

We sorted and classified the elements obtained from the survey and judged the attributes of these factors in accordance with the Kano model (Table 1).

Table 1. Classification of factors.

<table>
<thead>
<tr>
<th>Category</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic information</td>
<td>A1 Patient/family education</td>
</tr>
<tr>
<td></td>
<td>A2 Nursing instruction</td>
</tr>
<tr>
<td></td>
<td>A3 Basic rehabilitation guidance</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>B1 Regular assessment</td>
</tr>
<tr>
<td></td>
<td>B2 Clear rehabilitation plan</td>
</tr>
<tr>
<td></td>
<td>B3 Habilitation goals set by negotiation</td>
</tr>
<tr>
<td></td>
<td>B4 Regular psychological adjustment</td>
</tr>
<tr>
<td>Incentive</td>
<td>C1 Rehabilitation diary</td>
</tr>
<tr>
<td></td>
<td>C2 Experience sharing</td>
</tr>
<tr>
<td></td>
<td>C3 A good role model in patients</td>
</tr>
<tr>
<td>Pleasure</td>
<td>D1 Gamification rehabilitation approach</td>
</tr>
<tr>
<td></td>
<td>D2 Mutual support groups</td>
</tr>
</tbody>
</table>

We used an affinity diagram (or K-J method) [31] to divide the factors into four categories. Patient/family education (A1), nursing instruction (A2), and basic rehabilitation guidance (A3) were summarized as the basic information factors. For patients in the community, it is necessary to receive rehabilitation guidance and understand their relevant rationale, which can make the follow-up treatment and care easier. It is also a necessary step in improving motivation. Regular assessment (B1), a clear rehabilitation plan (B2), rehabilitation goals set by negotiation (B3), and regular psychological adjustment (B4) were summarized as effectiveness factors. We assumed that these factors belong to the Must-be quality or One-dimensional quality with respect to improving patients’ enthusiasm. These
factors guarantee the effect of rehabilitation training. Assessment, planning, and goals could enhance patients’ sense of purpose, while psychological adjustment is used to improve patients’ attitudes and stimulate initiative. Ensuring the effectiveness of rehabilitation is important to improve motivation and compliance. Rehabilitation diary (C1), experience sharing (C2), and a good role model in patients (C3) were summarized as incentive factors; we believed that these factors belong to One-dimensional quality or Attractive quality. These factors reflect the self-motivation of patients in the rehabilitation process and can help patients gain motivation. In addition, the gamification rehabilitation approach (D1) and mutual support groups (D2) were summarized as pleasure factors. We believed that these factors belong to Attractive quality. Gamification therapy and social interaction can promote a sense of fun and interaction in the process of rehabilitation so that patients can have a positive experience.

3.2.3. Questionnaire Based on the Kano Model

We designed a questionnaire using the Kano model to assess the attributes of patients’ needs factors. Each factor was linked to a pair of questions (a functional question and a dysfunctional question) [23,32]. Participants could choose from one of five answers (like, must-be, neutral, live with, and dislike) for each question.

We used the Kano evaluation matrix [33] to analyze the survey data statistically (Table 2). The matrix combines the answers of both functional and dysfunctional questions to yields a category for each attribute.

<table>
<thead>
<tr>
<th>Dysfunctional Question</th>
<th>Like</th>
<th>Must-be</th>
<th>Neutral</th>
<th>Live with</th>
<th>Dislike</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like</td>
<td>Q</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>O</td>
</tr>
<tr>
<td>Must-be</td>
<td>R</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>M</td>
</tr>
<tr>
<td>Neutral</td>
<td>R</td>
<td>I</td>
<td>I</td>
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<td>M</td>
</tr>
<tr>
<td>Live with</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>Q</td>
</tr>
<tr>
<td>Dislike</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>Q</td>
</tr>
</tbody>
</table>

1 Attractive attribute (A), one-dimensional attribute (O), must-be attribute (M), reverse attribute (R), indifferent attribute (I), and questionable result (Q).

This questionnaire was posted on the website of an online community for stroke patients. Participants were screened to ensure that they were stroke patients aged 50 to 65 years with more than 3 months of rehabilitation-training experience. A total of 107 responses were collected, of which 102 were valid. The other 5 questionnaires were invalidated for being incomplete.

We introduced the satisfaction coefficient proposed by Timko (1993) for data analysis to calculate the impact of the customer satisfaction and dissatisfaction [22]. Here, some requirements have similar frequencies among several categories. For that reason, the satisfaction coefficient was used to determine the extent of user satisfaction and dissatisfaction:

\[
Satisfaction\ index, \ SI = \frac{A + O}{A + O + M + I}, \quad (1)
\]

\[
Dissatisfaction\ index, \ DSI = \frac{M + O}{A + O + M + I}. \quad (2)
\]

4. Results

4.1. Findings

According to the results of the investigation and data analysis, we extracted the factors that affect the rehabilitation experience in the community. In addition, we used the Kano model to analyze this factors and got the satisfaction index and the dissatisfaction index of them (Table 3).
We plotted a scatter diagram in SPSS to present these indices more intuitively. These diagrams are presented in Figure 2. The abscissa of a scatter diagram is the DSI, and the ordinate is the SI. Two lines are drawn on the diagram for the average value of each index, which divide it into four quadrants [34]. The first quadrant corresponds to the one-dimensional attributes, the second quadrant to the attractive attributes, the third quadrant to the indifferent attributes, and the fourth quadrant to the must-be attributes. The prioritization of the requirements is based on the following rules: excluding the indifferent and reverse attributes, the must-be attributes > the one-dimensional attributes > the attractive attributes. In the same category, the larger the SI value, the higher the priority.

![Figure 2. Scatter diagram. The colors of the circles represent the phase.](image)

The factors regarding basic information are all Must-be qualities, which is close to our hypothesis. Patients must fully understand the rehabilitation treatment methods, nursing methods, and other information when receiving rehabilitation treatment. Treatment methods will be difficult to implement if patients lack complete cognition. The survey also revealed the importance of basic information in supporting patients’ psychological needs. A full understanding of the disease can effectively relieve patients’ tension and anxiety, while the sense of the unknown easily aggravates negative emotions. According to the
degree of satisfaction factor’s analysis, the basic rehabilitation guidance (A3) has larger DSI values, suggesting that patients perceive that rehabilitation knowledge is important. In the field interview, we also found that many inexperienced patients fell into a state of anxiety. Only by establishing complete cognition can patients actively cope with it. In addition, we also found that nursing instruction (A2) was closer to the Indifferent quality, although we considered this factor to be as important as basic rehabilitation guidance (A3), which reflects that patients do not realize the importance of the role of nursing knowledge in community rehabilitation. In hospitals, care is mainly carried out by professional health care workers, but in the community, there is often a lack of such conditions; thus, families need to provide assistance and patients need to self-care. If patients and their families are accustomed to being cared for by professional nursing staff and lack the knowledge of stroke nursing, it will be difficult to adapt to the rehabilitation situation in the community, which is not conducive to the promotion of enthusiasm.

Among the factors related to effectiveness, regular assessment (B1) and a clear rehabilitation plan (B2) are Must-be qualities, which is consistent with our expectations. Rehabilitation assessment and planning can make rehabilitation training more oriented, and patients feel that these services should be provided in the community. However, rehabilitation goals set by negotiation (B3) are classified as an undifferentiated need, even though rehabilitation goals can often generate significant motivation in practice. This unexpected result suggests that patients are not aware of the importance of goal setting. This may also indicate the deficiencies in the current rehabilitation services in the community, and the link to explaining the sense of purpose to patients is often neglected. In addition, a regular psychological adjustment (B4) is considered an Attractive quality. This indicates that patients do not think that a regular psychological adjustment can be guaranteed in the community, but they realize that psychological adjustments have positive effects and expect psychological support.

The factors related to incentives are mainly classified as Attractive qualities and One-dimensional qualities, which is consistent with our expectations. Experience sharing (C2) is a One-dimensional quality, suggesting that personal experiences from other patients may be more persuasive. At the same time, experience sharing can also serve as a channel for patients to communicate with others, which provides further motivation for them to avoid falling into self-isolation. In the scatter diagram, the rehabilitation diary (C1) is closer to the indifference quality. Recording the daily rehabilitation training content and progress is conducive to the implementation of rehabilitation goals. However, the concept has not been taken seriously as a routine community rehabilitation service. The help and guidance of a patient’s recovery diary can be provided in community rehabilitation services.

In the pleasure factors, the gamification rehabilitation approach (D1) is considered to be an Attractive quality. In the scatter diagram, the SI of this factor is higher. Although research on game therapy has developed, many experiments have not yet been applied to actual treatment. For patients, this is still a relatively new field, and they are willing to try it out. In addition, establishing mutual support groups (D2) is considered to be a One-dimensional quality and is currently recommended among patients, with some patients forming spontaneous support groups. Communication between patients has a positive effect on psychological adjustment and rehabilitation initiatives, and the research results also reflect the urgent needs of patients regarding communication in the community. In community rehabilitation treatment, these patient communities should be established and maintained in an organized way to benefit more patients.

According to the above research results, we can judge the direction of improvement or optimization in community rehabilitation services and identify the factors and priorities that affect patients’ rehabilitation initiatives. First, it is necessary to check whether patients and their families understand nursing methods and explain to them the basic precautions in community rehabilitation. Secondly, patients should understand the importance of rehabilitation plans, goals, and assessments in the community, and set long-term rehabilitation goals through consultation with patients. In addition, in the process of treatment, regular
psychological adjustments should be implemented to further attend to the psychological demands of patients. Recovery diaries and groups can also be introduced to enhance patients’ self-motivation and promote social interaction. If the conditions permit, some interesting gamification methods can also be introduced into the treatment to improve the pleasure of rehabilitation training.

4.2. Optimization Strategy

According to the survey results, we obtained a framework composed of four factors. Based on this framework, we proposed an optimization design for rehabilitation services in the community. Figure 3 shows the community rehabilitation services’ blueprint.

The above service flow allows patients to exercise autonomously in the absence of professional supervision. In addition, it can all be performed online. We integrated the existing rehabilitation treatments into the flow so that patients can complete rehabilitation training under guidance and make regular evaluations. Additionally, we integrated the incentive mechanism to help patients set rehabilitation goals and improve their enthusiasm.

At present, therapists provide patients with basic rehabilitation-training methods and nursing knowledge in the community. However, due to the shortage of social resources, such guidance is often temporary. Patients need to adjust their methods according to their rehabilitation situation. Regular online assessment services enable patients to access treatment information in a more timely manner. We also introduced the method of keeping a rehabilitation diary into the rehabilitation training system to help patients find their purposes. In addition, the system also incorporates reward mechanisms for achievement and mutual help as motivational tools. This system can continue to function over long rehabilitation cycles.

4.3. Design Practice

We divided the community rehabilitation training into three stages: initial, middle, and late. In the initial stage, patients are taught about rehabilitation knowledge and training methods. At the same time, the patients can set rehabilitation goals according to their conditions, and experts will recommend suitable rehabilitation-training programs. In the middle stage, the patients perform rehabilitation training according to rehabilitation courses, set rehabilitation schedules, and record their daily rehabilitation training. Patients will be required to undertake rehabilitation assessments regularly for their progress. In the evaluation, motion detection equipment can be used to analyze the limb movement status, and then judge the rehabilitation situation and give visual results. The evaluation results can be used as the basis for the adjustment of the rehabilitation program. During this period, a psychological analysis is also needed to stabilize the patient’s psychological state.

At the initial stage and the middle stage, patients should be aware of the importance of rehabilitation training and be familiar with the process of community rehabilitation training. Assessments and documentation can provide feedback to patients about their recovery and keep them motivated. The latter process is mainly to consolidate compliance and promote positive emotions. Through mutual support groups and reward systems, patients can receive encouragement from others, thus enhancing their initiative and positivity. The patients can also be given certain rewards to allow them to feel that the whole rehabilitation process has provided them with a sense of accomplishment and challenge and allow them to feel an improvement in self-worth. This service system runs through the various psychological stages of patients’ recovery in the community. By creating rehabilitation programs, guiding them to actively participate in training, and enhancing their social participation skills, these links encourage patients to actively participate in treatment.
On the basis of the service process, we design the service system to provide a more specific solution.
Basic information: Through research, we learned the content of rehabilitation education, mainly including family education, daily nursing guidance, and a basic rehabilitation common sense guide. In the design practice, we present the rehabilitation methods in the form of tutorials and set up different tutorials according to patients’ different rehabilitation conditions (Figure 4). Each tutorial is divided into multiple steps, which is convenient for promoting the patients’ learning.

**Figure 4.** Rehabilitation tutorial.

Effectiveness factor: In the design of the service system, we combine a rehabilitation assessment with rehabilitation objectives. Through regular rehabilitation assessments, patients can learn the next stage of rehabilitations’ goals, but also through visual data to understand the status of limb recovery (Figure 5). Through these auxiliary functions, patients can feel the rehabilitation’s effects more intuitively and receive more guidance.

Incentive factors: Keeping a recovery diary is an encouraging approach to community rehabilitation, but the lack of guidance makes it difficult to implement. Therefore, in the design of the service system, we use a schedule to show the daily training situation. This can have a positive effect by giving patients a clearer idea of whether they are sufficiently positive. The system can also rate patients according to their daily recovery and inform them of whether they have performed enough training through grading.

Pleasure factor: We design the program from the perspective of enhancing social interaction, forming the interaction between patients through experience sharing and communication, and establishing mutual aid groups among patients. In the social process, patients can receive inspiration and build strength through others, and then enhance their initiative and enthusiasm. In addition, we are also consider integrating gamified forms into community rehabilitation services, enhancing patients’ sense of achievement and acquisition through reward mechanisms, and making rehabilitation goals more attractive (Figure 6).
5. Discussion

In this paper, the Kano model method was applied in the optimization and evaluation of community stroke rehabilitation services to explore the factors that enhance the enthusiasm of stroke patients to participate in rehabilitation training in the community, so as
to improve the sustainability of community rehabilitation services. Through field visits and researching the literature, we analyzed the factors affecting patients’ enthusiasm for community rehabilitation therapy and sorted out the relevant research results. We judge the attributes of these elements based on a preliminary classification. These hypotheses were verified by the Kano model method and the results were analyzed. Finally, we provided suggestions for the improvement of community-based stroke rehabilitation services.

In the previous community visits and research of the literature, we obtained four types of factors affecting patients’ enthusiasm, namely, basic information, effectiveness, incentive, and pleasure. Through the verification of the Kano model approach, it can be confirmed that basic information factors are Must-be qualities, while validity factors also correspond to Must-be qualities, and incentive factors and pleasure factors are classified as One-dimensional qualities or Attractive qualities. The Kano model adopted in our study is a two-dimensional evaluation method that can identify the attributes of each evaluation factor by using a matrix and provide a clearer understanding of the status of each factor in a patient’s cognition. We also introduced the evaluation of the satisfaction coefficient to further refine and analyze the priority of different factors in the same attribute. In addition, we adhere to the principle of patient-centered treatment, focusing on the psychological needs of patients, which is different from the practice of judging patients’ behaviors based on the experience of professionals in the past. By comparing patients’ cognition with previous experience, we can make new discoveries.

Through our research, we realized that some treatments like nursing instruction (A2), rehabilitation goals set by negotiation (B3), and rehabilitation diary (C1) have been proven to work in hospitals and experiments but have not been well implemented. Patients lack a clear understanding of the importance of these factors and are not aware of their effectiveness. This suggests that we should provide correct guidance to make these effective rehabilitation methods play a positive role. In addition, we also recognize that incentive factors and pleasure factors are more important. Patients also expect these elements. The interactivity, interestingness, and humanization of community rehabilitation services can enhance the initiative of patients to participate in rehabilitation training.

In practice, we integrated basic rehabilitation information, rehabilitation assessment, goal setting, rehabilitation schedule, and rehabilitation community into the rehabilitation service process, we designed a service system that runs through different stages of community rehabilitation treatment, so that rehabilitation services can continue to play a role in a long cycle, which points out the direction for future rehabilitation service optimization.

6. Conclusions

Community rehabilitation services provide more opportunities for stroke patients to continue treatment after discharge. The increasing demand for community health services after the COVID-19 pandemic has also made the optimization of community rehabilitation treatment a hot topic. This study provides strategies for the sustainability of community rehabilitation services. The Kano model approach helped us define the attributes and priorities of the different factors, and we provided suggestions for motivating patients. Based on these studies, we developed a design scheme for community rehabilitation services. It can provide patients with nursing guidance and health assessments, help them to set up reasonable rehab plans, and help them achieve their rehabilitation goals gradually. By meeting patients’ psychological needs, the scheme can also improve the sustainability of rehabilitation training and social participation.

In this study, we used the Kano model method to verify the attributes of each factor and constructed a framework for improving the community rehabilitation experience. It has been concluded that the basic information and effectiveness factors are Must-be qualities, and the incentive factors and pleasure factors are One-dimensional qualities or Attractive qualities. We also discussed the problems that need to be addressed in community rehabilitation services. On the one hand, patients’ understanding of community rehabilitation should be improved. On the other hand, patients’ psychological needs
regarding interactivity, interest, and humanization need to be satisfied. These findings provide new ideas for the optimization of community rehabilitation services and improving the rehabilitation experience. Through these improvements, we can enhance the motivation of patients in the community and expand the benefits of community rehabilitation.

In this study, we deeply observed patients’ conditions through field visits and examined their psychological and emotional needs. We adhered to the principle of patient-centered treatment, which is different from the model based on expert experience used in previous studies. Previous studies often lacked patients’ participation, and researchers used comparative experiments to draw conclusions to prove the feasibility of a rehabilitation approach. The effects of these treatments are relatively stable in medical institutions. However, in the community, due to the lack of supervision, treatment methods are often difficult to implement. Patients are in a passive state, and their negative emotions affect the recovery effect. Patients have more initiative in the community. In order to mobilize the enthusiasm of patients and make them participate in rehabilitation training, it is necessary to understand their real needs. Furthermore, we used the Kano model to optimize the evaluation method of rehabilitation services. Through the Kano model and satisfaction coefficient, we divided the influencing factors of patient initiative into different quality attributes. This allowed us to distinguish the roles of different factors more accurately and identify the exact direction of service optimization. Patient-centered thinking and The Kano model approach enable us to effectively remedy the limitations of previous studies and design community rehabilitation services that can better meet the needs of patients.

To summarize, this study conforms to the current development trend of community rehabilitation services. It explores the factors that affect patients’ enthusiasm for rehabilitation training in the community. The results of this study will help to optimize community rehabilitation service processes, support the development of community rehabilitation service systems, and, consequently, create a positive environment for patients to recuperate. In addition, with our new community rehabilitation service, stroke patients can continue treatment after discharge and adapt to different treatment stages. As a result, home rehabilitation training can be conducted, which is especially important in the post-COVID-19 era, where it is crucial to promote the sustainable development of telemedicine and rehabilitation services.

7. Limitations of Study and Directions for Future Research

This study has some weaknesses and areas that require improvement. In this study, only patients aged 50–65 years were considered, and patient groups with other characteristics were not classified. The differences between patient groups were also not taken into account. To compare the differences regarding the rehabilitation motivation among patient groups, the characteristics of different patients need to be subdivided. In addition, time factors were not considered in this study. The process of rehabilitation treatment is long, so the psychological and emotional states of patients may evolve, which also influences the patients’ enthusiasm and compliance. To ensure the continuity of rehabilitation services, it is also important to analyze the impact in different phases. We have established a design framework; thus, in future research, we will subdivide the patient groups and set variables related to patient characteristics. This will help us to identify more personalized factors that influence the delivery of care services. On the other hand, we will evaluate the change in patient satisfaction over time. Karapanos et al. (2009) conducted an experiment to observe the changes in users’ attitudes when they used iPhone products for a few weeks and concluded that users’ concerns and psychological needs would undergo three phases, namely, orientation, incorporation, and identification [35]. Such longitudinal studies will be even more necessary in the field of rehabilitation services. At different phases, a patient’s perception of their disease will change, and their mood and psychological state will also be affected. In the future, we will consider follow-up observations in the community and use the Kano model approach to evaluate and distinguish patients’ needs for rehabilitation services at different phases.
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