Investigating the Influence of the Patient-Therapist Relationship on Adherence to Assistive Devices in Stroke-Rehabilitation

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Abstract:

The patient therapist relationship (PTR) is a critical component of treatment delivery in health care settings. This construct has potential to inform treatment efficacy and adherence to assistive devices (ADs) in stroke rehabilitation. This study aimed to evaluate the significance of the PTR in promoting adherence to AD recommendations and identify barriers patients encounter in using ADs. Additionally, we investigated whether the Working Alliance Inventory-Short Revised (WAI-SR) questionnaire captured information about the PTR that could enhance adherence. Four therapists and four stroke patients participated in interviews centered on therapist roles, patient experiences, and approaches to enhance adherence. Therapists were asked to evaluate the WAI-SR's ability to capture features of the PTR. To identify and analyze patterns of meaning in the interview data, thematic analysis was applied. Therapists emphasized collaborative decision-making to enhance adherence, fostering trust and communication. Patients reported trusting their therapists, who played a major role in instilling confidence in AD use. Patient barriers included: stigma, education gaps, device design flaws, costs, and memory limitations. Insights from the WAI-SR provided valuable information on PTR dynamics, potentially enhancing adherence strategies. The findings suggest that the quality of the PTR significantly influences AD use. They also offer insights into therapists' strategies for enhancing adherence, patients' barriers, and the WAI-SR's potential.

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Key Words:

Stroke rehabilitation, Patient-therapist relationship, Assistive devices, Adherence, Qualitative interview study

Résumé:

La relation entre le patient et le thérapeute (PTR) est un élément essentiel de la prestation de traitement dans les établissements de soins de santé. Ce concept a le potentiel d'informer sur l'efficacité du traitement et l'adhésion aux dispositifs d'assistance (DA) dans la réadaptation post-AVC. Cette étude avait pour but d'évaluer l'importance de la relation avec le thérapeute dans la promotion de l'adhésion aux recommandations relatives aux aides techniques et d'identifier les obstacles rencontrés par les patients dans l'utilisation des aides techniques. En outre, nous avons cherché à savoir si le questionnaire Working Alliance Inventory-Short Revised (WAI-SR) capturait des informations sur le PTR susceptibles d'améliorer l'adhésion. Quatre thérapeutes et quatre patients victimes d'un AVC ont participé à des entretiens centrés sur les rôles des thérapeutes, les expériences des patients et les approches visant à améliorer l'adhésion. Les thérapeutes ont été invités à évaluer la capacité du WAI-SR à saisir les caractéristiques du PTR. L'analyse thématique a permis d'identifier et d'analyser les schémas de signification des données d'entretien. Les thérapeutes ont mis l'accent sur la prise de décision en collaboration pour améliorer l'observance, en favorisant la confiance et la communication. Les patients ont déclaré faire confiance à leurs thérapeutes, qui ont joué un rôle majeur dans l'instauration de la confiance dans l'utilisation des médicaments antidiabétiques. Les obstacles rencontrés par les patients étaient les suivants : la stigmatisation, les lacunes en matière d'éducation, les défauts de conception des appareils, les coûts et les limitations de la mémoire. Le WAI-SR a fourni des informations précieuses sur la dynamique de la relation patient-patient, ce qui pourrait permettre d'améliorer les stratégies d'adhésion. Les résultats suggèrent que la qualité du PTR influence de manière significative l'utilisation de la MA. Ils donnent également un aperçu des stratégies des thérapeutes pour améliorer l'adhésion, des obstacles rencontrés par les patients et du potentiel du WAI-SR.

Mots-clés:

Réadaptation après un accident vasculaire cérébral, Relation patientthérapeute, Dispositifs d'assistance, Adhésion, Étude qualitative par entretien

Introduction

Stroke has been a significant global health concern, affecting millions of individuals and often resulting in long-term physical disabilities and motor impairments (Feigin et al., 2022; Khan et al., 2021). Stroke rehabilitation consists of various therapeutic interventions aimed at mitigating the impact of stroke-related brain damage and promoting recovery (Young & Forster, 2007). Among the diverse interventions utilized in stroke rehabilitation, assistive devices (ADs) play a crucial role in facilitating mobility, enhancing motor function, and supporting cognitive rehabilitation for stroke survivors (Willems et al., 2021; Tuazon et al., 2019; Barbosa et al., 2021).

Effective rehabilitation outcomes for stroke survivors relies on their adherence to therapy recommendations and the quality of the patient-therapist relationship (PTR; Bashir et al., 2022; Tuazon et al., 2019). Adherence to therapy, including the consistent use of ADs, has shown to be essential for maximizing functional recovery and improving overall quality of life poststroke (Lehane & McAuley, 2009; Bashir et al., 2022). Additionally, the PTR, characterized by mutual trust, effective communication, and shared decision-making between patients and therapists, is identified as a critical factor influencing adherence and treatment outcomes in rehabilitation settings (Hall et al., 2010; Lawton et al., 2016; Tuazon et al., 2019).

Despite the recognized importance of the PTR in stroke rehabilitation, there is a notable gap in the literature regarding standardized measurement methods and conceptual frameworks for evaluating PTR quality within the context of AD adherence (Hall et al., 2010; Lawton et al., 2016). This gap hinders our comprehensive understanding of how the PTR contributes to treatment efficacy and patient outcomes in stroke rehabilitation.

The aim of this study was to investigate the relationship between the PTR and adherence to ADs in stroke patients. We sought to address the following questions:

- 1. How does AD use relate to the PTR?
- 2. What barriers do patients face in trying to use their ADs?
- 3. How important is the PTR in promoting patient adherence to AD recommendations?
- 4. Do therapists believe that the working alliance inventory questionnaire captures useful information about the PTR?

Methodology

Study Design

This study was conducted at the stroke rehabilitation outpatient clinic of the Élisabeth Bruyère Hospital. A qualitative research design was used, involving semi-structured interviews to understand how the PTR influences adherence to AD recommendations in stroke rehabilitation,

from the perspectives of patients and therapists. The study proceeded in two phases. Ethics approval was obtained from the University of Ottawa and the Bruyère Research Ethics Board.

Recruitment

The research sample comprised 4 therapists and 4 patients enrolled in the Bruyère Stroke Rehabilitation Program. Therapists had a minimum of 3 years of experience with ADs in stroke rehabilitation, while patients had used at least one form of AD for mobility and cognitive needs for a minimum of 2 months and were able to communicate in English about their experiences. Participants were excluded if they were medically unstable and unable to effectively participate. Recruitment involved distributing flyers around the outpatient unit and engaging with clinical staff and patients at the outpatient clinic. Privacy protection was ensured, and participants received a \$25 visa gift card as compensation for their involvement.

Construction of the WAI & Measurement Properties

The WAI, originating from Bordin's (1979) conceptualization of the working alliance, comprises three key factors: agreement on goals, agreement on tasks, and the development and quality of the therapeutic bond. The WAI-SR (WAI-Short Revised), a 12-item version introduced by Hatcher and Gillaspy (2006), demonstrated improved representation of the three alliance factors and better fit in confirmatory factor analysis compared to its precursors. Initial validation studies indicated favorable psychometric properties, ease of

administration, good internal consistency, and adequate validity. The measurement properties of the WAI have been extensively evaluated, including validity, internal structure, reliability, construct validity, and responsiveness (Paap et al., 2022).

Data Collection Methods

In Phase 1, 30-minute semistructured interviews were conducted with stroke patients, exploring the ADs they used, their frequency of use, their perceived effectiveness, and their perspectives on the PTR. Example questions included: "How would you describe the level of trust and communication between you and your therapist(s)?" and "How do you find the assistive devices helpful in your daily activities?"

Phase 2 involved interviewing therapists to gain their perspective on the significance of PTR, its potential influence on adherence to AD recommendations, and their thoughts on the WAI-SR ability to capture important features of the PTR. Example questions for therapists included: "What significance does the patient-therapist relationship hold for you, and how do you believe it influences adherence to assistive device recommendations?" and "Can you describe how well you think the WAI-SR captures important features of the patient-therapist relationship for your patients?"

Data Analysis

A deductive thematic analysis was conducted to analyze interview data. Transcripts were reviewed for accuracy, and

a coding scheme was developed. Interview responses were openly coded and categorized into themes and sub-categories. Validation procedures, including member checking and coding checks by the supervisor, were utilized to ensure accuracy and credibility.

Results

Table 1 A summarizes patient characteristics, including patient demographic details such as age, gender, occupation, education level, marital status, and primary language. Table 1 B outlines therapist demographics, including years of experience, gender, and type of therapist. Table 2 displays the ADs used among the patients, mobility difficulties, types of ADs used, length of use, and frequency of use.

Table 3 A and B present the data analysis development, including themes, and categories for patient and therapist data.

Patient Themes

I. Relationship with Therapist

Patients valued their relationship with therapists, emphasizing factors like ease of conversation and proper AD usage demonstration. These aspects fostered trust and confidence in therapy progress. For instance, a patient using walking sticks expressed, "The relationship is, I trust her, and I know that she knows what she's talking about. And she was giving me an example on how to do it." [P04]

II. Perceived Barriers of AD Adherence

Patients reported key barriers to AD use: stigma, device design dissatisfaction, and lack of understanding how to use it. For

example, a patient using a cane expressed fear of stigma, saying, "Sort of that like fear of stigma, like what other people might think" [P02]. One patient mentioned dissatisfaction with their four-wheel walker's hard rubber wheels, which frequently hit their ankles while walking [P01]. Another patient found their walking sticks "too clunky" [P04]. Additionally, one patient initially resisted using an AD during therapy, mentioning, "Yeah, because I didn't know how, and at first I didn't really, didn't really want to use it because I was using it all wrong" [P03].

III. Collaborative Engagement in Finding Solutions

This theme highlights patients' collaborative efforts with therapists to address post-stroke challenges. Patients communicated concerns to therapists, who acknowledged and worked with them to overcome issues by offering recommendations and seeking patient input. For example, one patient mentioned their therapist teaching methods to manage vision and balance problems: "For instance, my vision is impaired, so they couldn't teach me directly. But they guided me through exercises and techniques for better balance." [P02]

This example highlights the personalized approach taken by therapists to address individual needs, thereby enhancing the overall rehabilitation experience for patients.

Therapist Themes

I. Teaching the Patient

This theme explored therapists' perspectives on educating patients to enhance adherence. They emphasized safety,

thorough instruction, consistent reminders, practice sessions, and encouragement to boost confidence. One therapist aimed to reduce cueing, empowering patients, and maximizing device effectiveness.

So, it's just making sure that they know what they need to practice and to establish what their equipment needs are, and then how to, the teaching regarding the proper use of them and practice... so determining on their present either physical, cognitive, perceptual deficits, what they sort of would optimize their function and their safety with their activities of daily living. [T03]

II. Common Barriers

This theme captures therapists' perspectives on patients' concerns, attitudes, and behaviors regarding devices. Most therapists emphasized cost and financing as significant barriers, along with patients forgetting to use them. Regarding financial barriers, one therapist stated: "Finance is a big thing, depending on the equipment, like some of them won't be able to purchase them. Especially, you know, if we're looking at a bigger equipment." [T04].

III. Navigating Barriers and Challenges

This theme refers to strategies therapists commonly employ to address challenges faced by patients and work towards proper solutions. In response to the barrier of finance and the cost of a device, therapists explained various problemsolving approaches:

One approach involves exploring different options, such as buying secondhand. We provide them with

various options and assess whether the device will be used long-term or part-time, considering renting instead of buying. [T03]

One therapist also described the importance of open discussions with the patients to identify issues and work towards solutions:

And so, I think it's just having that open discussion and making sure that if there's any issues that come up, in between that they sort of write it down, bring it back, and send it ... So that we can sort of problem-solve around it and see if there's another way of doing the task or another piece of equipment that could sort of help or a different way of doing it. [T03]

IV. Building Trust

This theme highlights factors contributing to patient trust in therapists, fostering a strong therapeutic relationship. Therapists use various strategies to connect with patients, aiming to create a comfortable environment. One therapist engaged in open discussions to understand post-stroke challenges.

...from intake, I'm asking them how they're managing ... And then it's just having sort of that frank discussion about and bringing it to their attention and just trying to see, well, sometimes maybe this might be more difficult since the stroke than prior to the stroke. [T03]

The therapist noted that facilitating these open discussions with patients enabled them to develop a greater sense of trust in her.

V. The WAI-SR

When assessing therapists' views on the WAI-SR's ability to gather PTR information for enhancing adherence, two main data sources were examined: therapist interviews and WAI-SR feedback. Overall, therapists rated the WAI-SR positively, giving it an average 80% rating for capturing essential PTR features. However, some therapists found certain questions repetitive, notably those related to goal setting: "Well, four, six, the goals ones, and then you have, well, again, eight's a little bit on the goals ones as well, because I agree it was important for me to work on." [T03]. Questions 4, 6, and 8 from the WAI-SR are listed below:

Question 4: "___and I collaborate on setting goals for my therapy."

Questions 6: "___and I are working towards mutually agreed upon goals."

Question 8: "___ and I agree on what is important for me to work on."

Another therapist commented on the client centered approach of the WAI-SR stating:

Yeah, it's, you know, I like some of the questions because of this session, I am clear on how I might be able to change. I'm doing, what I'm doing in therapy, give me a way to look at my problem, which is good. Client centered. [T04].

Discussion

Our study explored the unique experiences and perspectives of individuals with a stroke and therapists regarding the PTR and its influence on adherence to ADs. Patients' adherence to ADs was shaped by various factors within their relationship with

their therapists. Additionally, we identified initial barriers hindering patients from utilizing their devices, some of which were overcome with the assistance of therapists' recommendations, ultimately enhancing adherence.

Influence of the PTR

The PTR is based on trust, effective communication, and support from therapists. They dedicated time to guide patients in AD usage, encourage open conversation, and provide consistent reminders and support. This approach improved patients' device usage and increased their confidence and independence. These findings align with previous research showing that when patients feel confident, independent, and intrinsically motivated to use the AD, adherence is likely to increase (Tuazon et al., 2019).

Patients in our study found it easy to discuss their condition with therapists. One patient initially felt discouraged but found the constant support and encouragement from their therapist motivating and boosting her confidence in her abilities. This aligns with previous research that emphasizes importance of patients feeling heard, understood, and supported, particularly in the vulnerable early phases of rehabilitation (Kayes et al., 2021; Bishop et al., 2021; Walder & Molineux, 2019).

Building trust within the PTR seems to further encourage adherence, as patients feel assured by therapists who demonstrate genuine care, empathy, and transparency. A trusting environment fosters open, transparent communication that facilitates mutual understanding and implies patients'

comfort in the interaction (Williams & Douglas, 2021). Additionally, this trust promotes patient engagement in their recovery process (Williams & Douglas, 2021).

Educational support provided to patients about the importance of using ADs safely and independently are key factors within the PTR that influenced adherence (Tuazon et al., 2019). Therapists provided personalized education, sharing crucial fall prevention information and tailoring recommendations to patient needs. They also explained therapeutic decisions, enhancing patient involvement in their rehabilitation journey. Additionally, therapists emphasized consistent follow-up and progress checks regarding AD usage. This aligns with previous research highlighting the importance of adequate monitoring, as it encourages continual use of the AD and ensures that the intervention is a collaborative process between the healthcare professional and the user (Johnston et al., 2014). Enabling both parties to choose the most suitable AD for the individual can enhance communication and adherence, leading to improved rehabilitation outcomes (Tuazon et al., 2019).

Moreover, our findings regarding goal setting and collaborative engagement align with studies emphasizing collaboration based on mutual consensus regarding the individual's environment and characteristics (Bishop et al., 2021). Many studies emphasize the therapist's role in understanding the patient, identifying their needs (Kayes et al., 2021), and establishing meaningful goals (Gordon et al., 2022) to develop a shared approach (Bishop et al., 2019).

Additionally, therapists emphasized the importance of tailoring therapy to fit individual patient needs. This is consistent with previous studies highlighting the customization of rehabilitation as a crucial factor in the therapeutic alliance (Bishop et al., 2019; Walder & Molineux, 2019; Kayes et al., 2021). In a study by Lawton et al. (2018), the PTR is described as adapting behaviors to meet patients' needs, incorporating knowledge from both patient and therapist to foster mutual understandings that allow therapists to adapt their skills to the needs and preferences of the patient.

Barriers

One highlighted barrier in the literature is that ADs are often perceived as time-consuming and complex, requiring significant lifestyle adjustments. As discussed by Tuazon et al. (2019), AD interventions can be complex and timeconsuming for both patients and their families, posing challenges to adherence. Furthermore, nearly all AD interventions necessitate users to alter established behavior patterns, which may pose additional barriers, particularly for individuals who are more resistant to change (Tuazon et al., 2019). This aligns with our study's findings, where therapists described some patients hesitating to use the device due to perceived time requirements, beliefs in self-sufficiency, or concerns about space constraints in their homes.

In our study, patients initially disliked their ADs but gradually adapted, indicating a potential "dose" effect, where increased exposure improves acceptance and satisfaction. However, our findings indicate that this adaptation is not solely due to dose

exposure as a strong PTR also plays a critical role in facilitating acceptance. This aligns with research highlighting dose frequency as a significant barrier to adherence in therapy interventions, as cited by the World Health Organization (Burkhart & Sabaté, 2003). Nevertheless, it remains unclear what "dose" should entail in the context of AD interventions (Tuazon et al., 2019). Thus, determining the minimum effective dose necessary for an AD to induce functional changes may be crucial in ensuring adherence to AD recommendations (Warburton et al., 2006).

In our study, patients and therapists had equal input in AD intervention decisions. Therapists conducted assessments, narrowed down options, and considered patient preferences, such as choosing between a cane or a wheelchair. Hass et al. (1996) found that 75% of individuals with a stroke had no influence on their AD choice, which can lead to a feeling of detachment from therapists, a common barrier to adherence (Thomas et al., 2010; Hass et al., 1996). Research suggests therapists should strive for a more inclusive and transparent decision-making process with patients regarding ADs (Laplante-Lévesque et al., 2010), as those who feel they haven't effectively participated in AD selection are more likely to abandon them (Barbosa et al., 2021).

Financial cost was a major barrier to AD adherence identified by therapists, while patients emphasized design issues like clunkiness and lack of adaptability. This aligns with a study addressing high cost and low supply as barriers to AD access, along with the lack of customization for available products causing abandonment and resource waste (Gherardini et al., 2019). These findings underline the importance of device

design, as patients often cannot customize devices to their specific needs.

Similar to our study, the barriers pointed out by patients regarding design of device were discussed by Bashir et al. (2022) who pointed out barriers to orthotic devices such as medical, functional, device properties, and lack of proper fit. However, despite the positive aspects of improvements in gait, balance in the older adults, and a sense of security produced by using ADs, adherence remains less ideal due to barriers (Bashir et al., 2022). Like our findings Bashir et al. (2022) highlighted individualized AD adjustments, rehabilitation, and patient education as promising factors for increasing adherence. Overall, there must be collaborative efforts by policymakers, researchers, manufacturers, rehabilitation professionals, and device users to improve the design of technologies, develop appropriate funding and reimbursements plans, and reduce barriers regarding proper use of the device to support independence and quality of life in users (MacNeil et al., 2023).

WAI-SR and PTR

Therapists rated the WAI-SR highly for capturing PTR constructs, indicating its utility in measuring the PTR. Although the WAI-SR is credible for measuring the PTR, until recently, there was a lack of a theoretically robust measure tailored for stroke rehabilitation and adherence. Consequently, the link between therapeutic alliance and adherence, along with the development of assessment tools to measure this connection, has been a focal point in research (Heredia-Callejón et al., 2023). A recent development in this area is the creation of the "Aphasia and Stroke"

Therapeutic Alliance Measure (A-STAM)", the first accessible and theoretically robust measure of the therapeutic alliance (Heredia-Callejón et al., 2023). The A-STAM is not without its limitations. Sample size and the exclusion of individuals with more severe language impairments and their family members are main limitations (Lawton et al., 2019). Therefore, adjustments may be necessary to address these limitations to facilitate further research to understand the therapeutic alliance (Heredia-Callejón et al., 2023).

Nevertheless, the WAI-SR holds potential for effectively measuring the PTR in stroke rehabilitation settings and has been more extensively researched compared to the A-STAM thus far. Kao et al. (1998) conducted an extensive review to explore the conceptualization and measurement of the alliance. While they did not pinpoint a single unifying alliance model or measure, the most successful comprehensive measures of the alliance were identified as the WAI, the Vanderbilt Scales, and the California Scales (Kao et al., 1998). Sønsterud (2019) found the WAI-SR to be useful and reliable in investigating individualized stuttering treatment, with patients feeling comfortable with its items.

Conclusion

The findings suggest that the quality of the PTR significantly influences adherence to ADs in stroke rehabilitation settings. The identified themes from the interviews offer valuable insights into the perspectives of both therapists and patients regarding the PTR and the use of ADs in stroke rehabilitation. Furthermore, therapists' positive views on the WAI-SR suggest that it may be a useful tool for assessing and enhancing the quality of the PTR for stroke patients. The findings

highlight the need for interventions that enhance the quality of the PTR, particularly ones that target identified barriers to adherence.

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Table 1 A.Patient Characteristics

| Patient | Retired/occupation | Education | Marital | Gender | Age | Primary |
|---------|--------------------|------------|---------|--------|--------|----------|
| ID | | level | Status | | (yrs.) | language |
| P01 | Retired | Highschool | Married | Male | 76 | English |
| P02 | Retired | Highschool | Single | Male | 59 | Tamil |
| P03 | Retired | Bachelors | Married | Female | 65 | French |
| P04 | Retired | Highschool | Married | Female | 80 | English |

Table 1 B.Therapist Characteristics

| Therapist ID | Years of experiences | Gender | Type of Therapist |
|--------------|----------------------|--------|--------------------------|
| T01 | 15 | Female | Rehabilitation Assistant |
| T02 | 3 | Female | Physiotherapist |
| T03 | 26.5 | Female | Occupational Therapist |
| T04 | 10 | Female | Occupational Therapist |

Table 2. Assistive Device Usage

| Patient | Difficulty | Do you use | Do you use | Primary | Length | How often do |
|---------|------------|------------|-------------|-----------|---------------------------------------|----------------|
| ID | with | an AD? | more than | AD used | of use | you use your |
| | mobility? | (Yes/No) | one type of | for | (mo. / | AD? |
| | (Yes/No) | | AD? | mobility? | yrs.) | |
| | | | (Yes/No) | | , , , , , , , , , , , , , , , , , , , | |
| P01 | Yes | Yes | Yes | 4-Wheel | 7 mo. | Multiple times |
| | | | | Walker | | a day |
| P02 | Yes | Yes | No | Cane | 3 mo. | Multiple times |
| | | | | | | a day |
| P03 | Yes | Yes | No | Walking | One | Multiple times |
| | | | | Sticks | week | a day |
| | | | | | | |

| P04 | Yes | Yes | Yes | 4-Wheel | 4 mo. | Multiple times |
|-----|-----|-----|-----|---------|-------|----------------|
| | | | | Walker | | a day |
| | | | | | | |

Table 3 A.Data Analysis Development, Including Themes and Categories, for Patients

| Theme | Codes – (most common points in bold) | Code definition. | Code description. | References (id) |
|--|--|---|---|-----------------------|
| Relationship with therapist | | process, patients discussed the strength of their relationships with their therapists. | All patients expressed a positive relationship with their therapists, with 75% showing enthusiasm. They appreciated the ease of conversations, feeling comfortable, and the open discussions that ensured their concerns were heard and addressed through proper recommendations. | P01, P02, P03, P04 |
| Perceived barriers of AD adherence | understanding benefits; lifestyle clashes | Patients emphasized the common challenges that hinder their use of assistive devices or deter them from wanting to use them. | | P01, P02, P03, P04 |
| finding solutions | Adjusting to different settings; Narrowing down the issue; Referral; Adopting recommendations in day-to-day life; Exercise outside the clinic; | Patients discussed the collaborative method used by the therapist to involve the patient in finding solutions to health issues post stroke. | 1 3 1 | P01, P02, P03, P04 |

Table 3 B.Data Analysis Development, Including Themes and Categories, for Therapists

| Theme | Codes – (most common points in bold) | Code definition. | Code description. | References (ID) |
|--------------------------|---|--|--|-----------------------|
| Teaching the patient | process; Practice; Proper education; Proper usage; Reduce cuing ; Reminders; Right fit; Safety; Support; Teaching | educating patients on their assistive devices. | Therapists found that these methods fostered patient comfort, increased feelings of safety and trust, and promoted engagement in goal-oriented work. | |
| Common Barriers | Hesitation; Preconception; lack of Resources; Stubbornness | Therapists' views on patients' concerns, attitudes, and behaviors regarding the devices. | Cost and financing of devices and patient forgetfulness were common issues. | T01, T02, T03, T04 |
| Navigating Challenges | Explaining; Giving options; Listening to patient concerns; | guide clients through challenges. | Therapists navigated challenges through a team approach, actively involving patients in their rehabilitation, exploring alternative options for assistive devices, and making new recommendations when needed. | T01, T02, T03, T04 |

| Building Trust | Asking for feedback; Asking questions; Assurance in safety; | Discussion of factors that | Therapists used strategies to build | T01, T02, T03, |
|-----------------------|---|-----------------------------|--------------------------------------|----------------|
| | Being engaged; Being receptive; Building confidence; | encourage patients to trust | trust with patients, enhancing their | T04 |
| | Encouraging; Establishing goals; Establishing patients' | their therapist. | comfort and success during | |
| | needs; Explaining process; Feel comfortable; Following | | sessions. | |
| | up; Involve the patient; Kindness; Listening to needs; | | | |
| | Motivation; Not being pushy; Open discussion; Patience; | | | |
| | Reassurance; Sense of control and understanding | | | |

References

- Barbosa, I. M., Alves, P. R., & Silveira, Z. C. (2021). Upper limbs' assistive devices for stroke rehabilitation: A systematic review on design engineering solutions. Journal of the Brazilian Society of Mechanical Sciences and Engineering, 43(5), 236. https://doi.org/10.1007/s40430-021-02919-4
- Bashir, A. Z., Dinkel, D. M., Pipinos, I. I., Johanning, J. M., & Myers, S. A. (2022). Patient Compliance With Wearing Lower Limb Assistive Devices: A Scoping Review. Journal of Manipulative and Physiological Therapeutics, 45(2), 114–126. https://doi.org/10.1016/j.jmpt.2022.0/4.003
- Besley, J., Kayes, N. M., & McPherson, K. M. (2011). Assessing therapeutic relationships in physiotherapy: Literature review. New Zealand Journal of Physiotherapy, 39(2), 81–92. Bishop, M., Kayes, N., & McPherson, K. (2019). Understanding the therapeutic alliance in stroke rehabilitation. Disability and Rehabilitation, 43(8), 1074–1083. https://doi.org/10.1080/09638288.20 19.1651909
- Bordin, E. S. (1979). The generalizability of the psychoanalytic concept of the working alliance. Psychotherapy: Theory, Research & Practice, 16(3), 252–260. https://doi.org/10.1037/h0085885
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology,

- 3(2), 77–101. https://doi.org/10.1191/1478088706q p063oa
- Broderick, P., Horgan, F., Blake, C., Ehrensberger, M., Simpson, D., & Monaghan, K. (2018). Mirror therapy for improving lower limb motor function and mobility after stroke: A systematic review and meta-analysis. Gait & Posture, 63, 208–220. https://doi.org/10.1016/j.gaitpost.2018.05.017
- Burkhart, P. V., & Sabaté, E. (2003).

 Adherence to long-term therapies: evidence for action. Journal of nursing scholarship: an official publication of Sigma Theta Tau International Honor Society of Nursing, 35(3), 207.
- Chen, Y., Abel, K. T., Janecek, J. T., Chen, Y., Zheng, K., & Cramer, S. C. (2019). Home-based technologies for stroke rehabilitation: A systematic review. International Journal of Medical Informatics, 123, 11–22. https://doi.org/10.1016/j.ijmedinf.2018.12.001
- Feigin, V. L., Brainin, M., Norrving, B.,
 Martins, S., Sacco, R. L., Hacke, W.,
 Fisher, M., Pandian, J., & Lindsay,
 P. (2022). World Stroke
 Organization (WSO): Global Stroke
 Fact Sheet 2022. International
 Journal of Stroke, 17(1), 18–29.
 https://doi.org/10.1177/17474930211
 065917
- Gherardini, F., Mascia, M. T., Bettelli, V., & Leali, F. (2018). A Co-Design Method for the Additive Manufacturing of Customised Assistive Devices for Hand

- Pathologies. Journal of Integrated Design and Process Science, 22(1), 21–37. https://doi.org/10.3233/jid-2018-0002
- Gordon, C., Ellis-Hill, C., Dewar, B., & Watkins, C. (2022). Knowing-inaction that centres humanising relationships on stroke units: An appreciative action research study. Brain Impairment, 23(1), 60–75. https://doi.org/10.1017/BrImp.2021.34
- Grbich, C. (1999). Qualitative research in health: An introduction (pp. viii, 312). Sage Publications Ltd.
- Hall, A. M., Ferreira, P. H., Maher, C. G., Latimer, J., & Ferreira, M. L. (2010). The Influence of the Therapist-Patient Relationship on Treatment Outcome in Physical Rehabilitation: A Systematic Review. Physical Therapy, 90(8), 1099–1110. https://doi.org/10.2522/ptj.20090245
- Hass, U., Fredén-Karlsson, I., & Persson, J. (1996). Assistive technologies in stroke rehabilitation from a user perspective. Scandinavian Journal of Caring Sciences, 10(2), 75–80. https://doi.org/10.1111/j.1471-6712.1996.tb00315.x
- Hatcher, R. L., & Gillaspy, J. A. (2006).

 Development and validation of a revised short version of the working alliance inventory. Psychotherapy Research, 16(1), 12–25.

 https://doi.org/10.1080/10503300500

 352500
- Heredia-Callejón, A., García-Pérez, P., Armenta-Peinado, J. A., Infantes-Rosales, M. Á., & Rodríguez-Martínez, M. C. (2023). Influence of the Therapeutic Alliance on the Rehabilitation of Stroke: A

- Systematic Review of Qualitative Studies. Journal of Clinical Medicine, 12(13), Article 13. https://doi.org/10.3390/jcm12134266
- Horvath, A. O., & Greenberg, L. S. (1989).

 Development and validation of the Working Alliance Inventory. Journal of Counseling Psychology, 36(2), 223–233.

 https://doi.org/10.1037/0022-0167.36.2.223
- Jamshed, S. (2014). Qualitative research method-interviewing and observation. Journal of Basic and Clinical Pharmacy, 5(4), 87–88. https://doi.org/10.4103/0976-0105.141942
- Johnston, P., Currie, L. M., Drynan, D.,
 Stainton, T., & Jongbloed, L. (2014).
 Getting it "right": How collaborative relationships between people with disabilities and professionals can lead to the acquisition of needed assistive technology. Disability and Rehabilitation: Assistive
 Technology, 9(5), 421–431.
 https://doi.org/10.3109/17483107.20
 14.900574
- Jutai, J., Coulson, S., Teasell, R., Bayley, M., Garland, J., Mayo, N., & Wood-Dauphinee, S. (2007). Mobility
 Assistive Device Utilization in a Prospective Study of Patients With First-Ever Stroke. Archives of Physical Medicine and Rehabilitation, 88(10), 1268–1275. https://doi.org/10.1016/j.apmr.2007.06.773
- Kao, A. C., Green, D. C., Davis, N. A., Koplan, J. P., & Cleary, P. D. (1998). Patients' trust in their physicians: Effects of choice, continuity, and payment method. Journal of General Internal

- Medicine, 13(10), 681–686. https://doi.org/10.1046/j.1525-1497.1998.00204.x
- Kayes, N. M., Cummins, C., McPherson, K. M., Worrall, L., & Bright, F. A. S. (2022). Developing connections for engagement in stroke rehabilitation. Brain Impairment, 23(1), 42–59. https://doi.org/10.1017/BrImp.2021.27
- Khan, M. A., Saibene, M., Das, R., Brunner, I., & Puthusserypady, S. (2021).

 Emergence of flexible technology in developing advanced systems for post-stroke rehabilitation: A comprehensive review. Journal of Neural Engineering, 18(6), 061003.

 https://doi.org/10.1088/1741-2552/ac36aa
- Laplante-Lévesque, A., Hickson, L., & Worrall, L. (2010). Rehabilitation of older adults with hearing impairment: A critical review.

 Journal of Aging and Health, 22(2), 143–153.

 https://doi.org/10.1177/08982643093

 52731
- Lawton, M., Conroy, P., Sage, K., & Haddock, G. (2019). Aphasia and stroke therapeutic alliance measure (A-STAM): Development and preliminary psychometric evaluation. International Journal of Speech-Language Pathology, 21(5), 459–469.

 https://doi.org/10.1080/17549507.20
 19.1648551
- Lawton, M., Haddock, G., Conroy, P., & Sage, K. (2016). Therapeutic Alliances in Stroke Rehabilitation: A Meta-Ethnography. Archives of Physical Medicine and Rehabilitation, 97(11), 1979–1993.

- https://doi.org/10.1016/j.apmr.2016.
- Lawton, M., Sage, K., Haddock, G., Conroy, P., & Serrant, L. (2018). Speech and language therapists' perspectives of therapeutic alliance construction and maintenance in aphasia rehabilitation post-stroke. International Journal of Language & Communication Disorders, 53(3), 550–563.

 https://doi.org/10.1111/1460-6984.12368
- Lehane, E., & McCarthy, G. (2009).

 Medication non-adherence—
 Exploring the conceptual mire.
 International Journal of Nursing
 Practice, 15(1), 25–31.

 https://doi.org/10.1111/j.1440-172X.2008.01722.x
- MacNeil, M., Hirslund, E., Baiocco-Romano, L., Kuspinar, A., & Stolee, P. (2023). A scoping review of the use of intelligent assistive technologies in rehabilitation practice with older adults. Disability and Rehabilitation. Assistive Technology, 1–32.

 https://doi.org/10.1080/17483107.20
 23.2239277
- Maggio, M. G., Latella, D., Maresca, G., Sciarrone, F., Manuli, A., Naro, A., De Luca, R., & Calabrò, R. S. (2019). Virtual Reality and Cognitive Rehabilitation in People With Stroke: An Overview. The Journal of Neuroscience Nursing: Journal of the American Association of Neuroscience Nurses, 51(2), 101–105.

 https://doi.org/10.1097/JNN.000000 00000000423
- Malik, A. N., Tariq, H., Afridi, A., & Rathore, F. A. (2022). Technological advancements in stroke

- rehabilitation. JPMA. The Journal of the Pakistan Medical Association, 72(8), 1672–1674. https://doi.org/10.47391/JPMA.22-90
- Munder, T., Wilmers, F., Leonhart, R., Linster, H. W., & Barth, J. (2010). Working Alliance Inventory-Short Revised (WAI-SR): Psychometric properties in outpatients and inpatients. Clinical Psychology & Psychotherapy, 17(3), 231–239. https://doi.org/10.1002/cpp.658
- Paap, D., Karel, Y. H. J. M., Verhagen, A. P., Dijkstra, P. U., Geertzen, J. H. B., & Pool, G. (2022). The Working Alliance Inventory's Measurement Properties: A Systematic Review. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.945294
- Sturgiss, E. A., Rieger, E., Haesler, E., Ridd, M. J., Douglas, K., & Galvin, S. L. (2019). Adaption and validation of the Working Alliance Inventory for General Practice: Qualitative review and cross-sectional surveys. Family Practice, 36(4), 516–522. https://doi.org/10.1093/fampra/cmy113
- Sønsterud, H. (2019). The Importance of the Working Alliance in the Treatment of Cluttering. Perspectives of the ASHA Special Interest Groups, 4(6), 1568–1572. https://doi.org/10.1044/2019_PERS-19-00057
- Thomas, W., Pinkelman, L., & Gardine, C. (2010). The Reasons for Noncompliance with Adaptive Equipment in Patients Returning Home After a Total Hip Replacement. Physical & Occupational Therapy in Geriatrics,

- 28, 170–180. https://doi.org/10.3109/02703181003 698593
- Tracey, T. J., & Kokotovic, A. M. (1989).
 Factor structure of the Working
 Alliance Inventory. Psychological
 Assessment: A Journal of Consulting
 and Clinical Psychology, 1(3), 207–
 210. https://doi.org/10.1037/1040-3590.1.3.207
- Tuazon, J. R., Jahan, A., & Jutai, J. W. (2019). Understanding adherence to assistive devices among older adults: A conceptual review. Disability and Rehabilitation: Assistive Technology, 14(5), 424–433. https://doi.org/10.1080/17483107.20 18.1493753
- Walder, K., & Molineux, M. (2020).

 Listening to the client voice A constructivist grounded theory study of the experiences of client-centred practice after stroke. Australian Occupational Therapy Journal, 67(2), 100–109.

 https://doi.org/10.1111/1440-1630.12627
- Warburton, D. E. R., Nicol, C. W., & Bredin, S. S. D. (2006). Prescribing exercise as preventive therapy. CMAJ, 174(7), 961–974. https://doi.org/10.1503/cmaj.104075
- Willems, E. M. G., Vermeulen, J., van
 Haastregt, J. C. M., & Zijlstra, G. A.
 R. (2022). Technologies to improve
 the participation of stroke patients in
 their home environment. Disability
 and Rehabilitation, 44(23), 7116–
 7126.
 https://doi.org/10.1080/09638288.20
 21.1983041

- Williams, L. M., & Douglas, J. M. (2022). It takes two to tango: The therapeutic alliance in community brain injury rehabilitation. Brain Impairment, 23(1), 24–41. https://doi.org/10.1017/BrImp.2021.26
- Young, J., & Forster, A. (2007). Review of stroke rehabilitation. BMJ: British Medical Journal, 334(7584), 86–90. https://doi.org/10.1136/bmj.39059.456794.68