



Article

Delivering Occupation-Based Practice in Stroke Rehabilitation of Hospital Settings: Thai Occupational Therapists' Experiences

Kaunnil, Anuchart, Sansri, Veerawat, Thongchoomsin, Surachart, Permpoonputtana, Kannika, Juntorn, Sutinun, Jarvis, Kathryn, Reyes Smith, Cristina, Palapal Sy, Michael, Griffiths, Jiranan, Nopparat, Chutikorn and Thichanpiang, Peeradech

Available at <https://clock.uclan.ac.uk/45445/>

Kaunnil, Anuchart, Sansri, Veerawat, Thongchoomsin, Surachart, Permpoonputtana, Kannika, Juntorn, Sutinun, Jarvis, Kathryn orcid iconORCID: 0000-0001-5963-7346, Reyes Smith, Cristina, Palapal Sy, Michael, Griffiths, Jiranan et al (2023) Delivering Occupation-Based Practice in Stroke Rehabilitation of Hospital Settings: Thai Occupational Therapists' Experiences. The Qualitative Report, 28 (1). ISSN 21603715

It is advisable to refer to the publisher's version if you intend to cite from the work.

doi:10.46743/2160-3715/2023.5591

For more information about UCLan's research in this area go to <http://www.uclan.ac.uk/researchgroups/> and search for <name of research Group>.

For information about Research generally at UCLan please go to <http://www.uclan.ac.uk/research/>

All outputs in CLoK are protected by Intellectual Property Rights law, including Copyright law. Copyright, IPR and Moral Rights for the works on this site are retained by the individual authors and/or other copyright owners. Terms and conditions for use of this material are defined in the [policies](#) page.

1-20-2023

Delivering Occupation-Based Practice in Stroke Rehabilitation of Hospital Settings: Thai Occupational Therapists' Experiences

Anuchart Kaunnil

Chiang Mai University, anuchart.kau@cmu.ac.th

Veerawat Sansri

Navamindradhiraj University

Surachart Thongchoomsin

Mahidol University

Kannika Permpoonputtana


Mahidol University

Sutinun Juntorn

Mahidol University

See next page for additional authors

Follow this and additional works at: <https://nsuworks.nova.edu/tqr>

 Part of the [Occupational Therapy Commons](#), and the [Quantitative, Qualitative, Comparative, and Historical Methodologies Commons](#)

Recommended APA Citation

Kaunnil, A., Sansri, V., Thongchoomsin, S., Permpoonputtana, K., Juntorn, S., Jarvis, K., Reyes Smith, C., Palapal Sy, M., Griffiths, J., Nopparat, C., & Thichanpiang, P. (2023). Delivering Occupation-Based Practice in Stroke Rehabilitation of Hospital Settings: Thai Occupational Therapists' Experiences. *The Qualitative Report*, 28(1), 252-268. <https://doi.org/10.46743/2160-3715/2023.5591>

This Article is brought to you for free and open access by the The Qualitative Report at NSUWorks. It has been accepted for inclusion in The Qualitative Report by an authorized administrator of NSUWorks. For more information, please contact nsuworks@nova.edu.



Delivering Occupation-Based Practice in Stroke Rehabilitation of Hospital Settings: Thai Occupational Therapists' Experiences

Abstract

Occupation-based practice (OBP) is central to the practice of occupational therapists where occupations or meaningful activities become the focus of the assessment, intervention, and outcomes measurement process. Although occupational therapists practising in Thailand claim that they engage in OBP, this claim warrants empirical investigation. This study aimed to investigate the experiences and perceptions of hospital-based occupational therapists of OBP within stroke rehabilitation. Utilizing a qualitative design, fourteen occupational therapists were recruited through purposive sampling. Data were collected through semi-structured interviews until data saturation was reached. Each interview was recorded and transcribed verbatim, and data were analyzed using thematic analysis. Five themes were identified (1) Perspective towards OBP, (2) OBP as professional value and cultural identity, (3) Implementing OBP for stroke rehabilitation in hospital settings, (4) Environmental factors of using OBP in stroke rehabilitation, and (5) OBP in the service management. Occupational therapists perceived that OBP is important for professional identity. Using OBP provides positive changes in stroke clients. This study provides evidence that will help implement OBP into occupational therapy in Thailand.

Keywords

occupation-based practice, stroke rehabilitation, occupational therapists, phenomenology

Creative Commons License



This work is licensed under a [Creative Commons Attribution-NonCommercial-Share Alike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/).

Acknowledgements

This research project was supported by Faculty of Physical Therapy, Mahidol University, Thailand, grant number 0517.391 (4.2)/027, 2015.

Authors

Anuchart Kaunnil, Veerawat Sansri, Surachart Thongchoomsin, Kannika Permpoonputtana, Sutinun Juntorn, Kathryn Jarvis, Cristina Reyes Smith, Michael Palapal Sy, Jiranan Griffiths, Chutikorn Nopparat, and Peeradech Thichanpiang

Delivering Occupation-Based Practice in Stroke Rehabilitation of Hospital Settings: Thai Occupational Therapists' Experiences

Anuchart Kaunnil¹, Veerawat Sansri², Surachart Thongchoomsin³, Kannika Permpoonputtana⁴, Sutinun Juntorn³, Kathryn Jarvis⁵, Cristina Reyes Smith⁶, Michael Palapal Sy⁷, Jiranan Griffiths¹, Chutikorn Nopparat⁸, and Peeradech Thichanpiang^{3,*}

¹Department of Occupational Therapy, Faculty of Associated Medical Sciences, Chiang Mai University, Thailand

²Department of Basic Medical Science, Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Thailand

³Division of Occupational Therapy, Faculty of Physical Therapy, Mahidol University, Thailand

⁴National Institute for Child and Family Development, Mahidol University, Thailand

⁵School of Sport and Health Sciences, University of Central Lancashire, UK

⁶Division of Occupational Therapy, Medical University of South Carolina, USA

⁷National Teacher Training Center for the Health Professions, University of the Philippines, Philippines

⁸Innovative Learning Center, Srinakharinwirot University, Thailand

Occupation-based practice (OBP) is central to the practice of occupational therapists where occupations or meaningful activities become the focus of the assessment, intervention, and outcomes measurement process. Although occupational therapists practising in Thailand claim that they engage in OBP, this claim warrants empirical investigation. This study aimed to investigate the experiences and perceptions of hospital-based occupational therapists of OBP within stroke rehabilitation. Utilizing a qualitative design, fourteen occupational therapists were recruited through purposive sampling. Data were collected through semi-structured interviews until data saturation was reached. Each interview was recorded and transcribed verbatim, and data were analyzed using thematic analysis. Five themes were identified (1) Perspective towards OBP, (2) OBP as professional value and cultural identity, (3) Implementing OBP for stroke rehabilitation in hospital settings, (4) Environmental factors of using OBP in stroke rehabilitation, and (5) OBP in the service management. Occupational therapists perceived that OBP is important for professional identity. Using OBP provides positive changes in stroke clients. This study provides evidence that will help implement OBP into occupational therapy in Thailand.

Keywords: occupation-based practice, stroke rehabilitation, occupational therapists, phenomenology

* Corresponding author

Introduction

At present, occupational therapists continue to struggle in placing occupation at the center of their professional services, that is, using occupations both as the primary therapeutic agent and the goal of the intervention. An occupation-centered perspective is a professional lens where occupation is placed at the center of the occupational therapy that includes occupation-focused and occupation-based. Occupation-focused is the information of individual, environment and occupation related to performance, while occupation-based is the use of occupation as the main ingredient in assessment, intervention, and outcome measurement (Fisher, 2014). Within the practice of occupational therapy (OT), the occupation-based practice is using occupation as a means and an end (Gray, 1998), with another author postulating that occupation as the framework for intervention (Helene et al., 2003). In clinical practice, using OBP is essential to emerge and reinvigorate OT professional reasoning (Hocking, 2001). Hence, OBP is clearly a principle and has powerful potential to enhance client-centered approaches with meaningful occupations and activities integrated throughout the OT process. The use of OBP can be directed the occupations to improve clients' health, everyday life activities, social participation and quality of life (Khayatadeh Mahani et al., 2015).

In Thailand, cardiovascular disease or stroke has been a major health concern that leads to disability and death (Luft & Katan, 2018). With 250,000 new cases of stroke in Thailand every year, the national government has instituted a tripartite insurance scheme—Social Security Scheme, Civil Servant Medical Benefit Scheme, and Universal Coverage Scheme—to provide the Thai population with universal health coverage which aims to improve population health outcomes (Kantamaturapoj et al., 2020). Literature articulates how stroke affects a person's overall physical, mental, cognitive, and emotional processes which impact occupational performance and participation (Edmans, 2010). Within the health related to everyday life activities, most stroke clients suffered from the disability in activities of daily living, work and social participation that necessitates occupational therapy services. Hence, occupational therapists play a pivotal role in working with persons affected by stroke through the activation of OBP (Kielhofner, 2008).

To maximize the effects of OBP, occupational therapists are further expected to consider socio-cultural and physical contexts when providing their services. Occupational therapists have a special role to play in the successful transition of clients affected with stroke from rehabilitation to occupational participation, there remains a gap and struggle with the implementation of OBP (Mohammed Alotaibi et al., 2009). Studies on OBP specifically revealed the improvement of self-care performance of stroke clients across inpatient, outpatient, home, and community settings (Langhorne & Pollock, 2002; Legg et al., 2017). This is supported by a review of occupation-based intervention that showed the benefits in addressing targeted activities of daily living and facilitating social engagement for stroke clients (Wolf et al., 2015). Other studies included an occupational-based approach in chronic (Tomori et al., 2015) and sub-acute stroke survivors that led to significant improvements in impairment and general health (Tomori et al., 2015) and neurophysiological and behavioral outcomes (Skubik-Peplaski et al., 2017). A recent scoping review found that occupation-based groups within inpatient rehabilitation settings are utilized underpinned by goal-based and patient-centered approaches (Spalding et al., 2020). However, the same literature review revealed the lack of high-quality evidence to demonstrate how occupation-based groups impact on post-discharge outcomes.

Currently, Thailand only has 1,674 registered occupational therapists (Bureau of Sanatorium and Art of Healing, 2022) and three occupational therapy schools (Srikhamjak et

al., 2022). In physical rehabilitation, most occupational therapists are working with stroke are in the hospital settings (Bureau of Sanatorium and Art of Healing, 2022). Recently, the occupational therapy profession in Thailand has proactively made efforts to introduce OBP in education and practice (Kaunnil et al., 2021). Additionally, OBP is being cultivated in Thailand through its cultural values characterized by collectivism and interdependence (Giacomin & Jordan, 2017). Thai occupational therapists are called to deliberately use OBP, not just because it has been professionally mandated, but because it is beneficial to clients with stroke. However, the implementation of OBP among Thai occupational therapists remains unclear. This article aims to understand the experiences and perceptions of Thai occupational therapists in hospital settings on the use of OBP in stroke rehabilitation.

Methods

Design

The qualitative phenomenological study explored contributing factors through the experiences and perceptions of Thai occupational therapists via semi-structured interviews. The aim was to find ways in which occupational therapists deliver OBP to stroke clients and reflect recommendations to the occupation as a therapeutic intervention. It was to identify how occupational therapists deliver OBP to stroke clients and generate recommendations on how occupations could be better utilized for therapeutic use. This study received ethical approval from the Mahidol University Central Institutional Review Board, reference number MU-CIRB 2015/082.3006. and the Institutional Review Board of Neurological Institute of Thailand, reference number 61024.

Participants

A purposive sampling technique was employed to collect and analyze data from participants, the study included occupational therapists who: (1) possess a national occupational therapy license; (2) work in general rehabilitation; (3) have more than 2 years of experience in stroke service; (4) work in the city of Bangkok and surrounding areas; (5) indicate the interest in OBP implementation, and (6) participate in an interview. Advertisements were sent to hospitals and health institutes in Bangkok and the surrounding areas over two months. After participants were contacted by the research team, they were selected based on the inclusion criteria.

Interview Procedure

The interview guidelines were designed and refined by an iterative process involving mock individual in-depth interviews prior to its use. The semi-structured interviews comprised questions about (1) viewpoint of OBP, (2) OBP implementation, and (3) facilitator and barriers (Table 1). The interview process was organized in a natural and logical sequence and conducted in a location offering a comfortable setting and separated from the rest of the workspace, a quiet corner.

Table 1

Example Interview Questions

Questions	
1	What is OBP in your viewpoint?
2.	Why is the use of OBP important for stroke rehabilitation?
3.	What occupations do you use when utilizing OBP in stroke rehabilitation?
4.	How do you implement OBP to fit clients with CVD?
5.	What are the opportunities that facilitate the use of OBP?
6.	What are the obstacles that hinder you from implementing OBP?

Data Collection

Data were collected through semi-structured interviews from March to July 2018. The researcher contacted the occupational therapists based on the inclusion criteria to arrange the most convenient time and location for an individual interview. This was conducted by an author following a semi-structured interview guide. Each participant was required to read and sign a written consent form before the interview. This interview was audio-recorded and transcribed verbatim, each in-depth interview required approximately 1.5 to 2 hours.

Data Analysis

All in-depth interview data gathered were transcribed verbatim. In the beginning, each transcript was read and reviewed independently by three researchers, and then the results were compared. This study was analyzed by thematic analysis (Braun & Clarke, 2006). This analytical process involved six steps: (1) familiarization with data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. The data analysis began by reading the transcriptions three times to extract the meaning out of the shared experiences of the participants towards OBP. Then, initial codes were generated based on the meaning conveyed by the texts, phrases, and sentences. Consequently, the codes were organized into initial themes, which were connected to or separated from each other to develop final themes through an iterative analytical process. Quotations to support the themes and subthemes were identified, named, and defined. Lastly, the authors reviewed if the themes indeed addressed the research aim.

Rigor and Trustworthiness

Research processes were clearly documented, and the transcripts were peer-reviewed by the team. Pseudonyms were used to protect the identity of the participants. The researcher tried to establish and gain participants' confidence through effective communication. Mutual trust was built, and participants improved as much by listening and understanding as by providing information before the interview. Authors considered potential translation-related problems that might affect the reliability of the findings. Detailed transcripts were analyzed word-for-word from the native language (Thai) and then transcribed into English (Twinn, 1998), which were then checked by two English-speaking researchers and a bilingual speaker. The rigor and trustworthiness of the emerging themes were supported by the research team analyzing the data independently and agreeing on the themes after analyzing each transcript.

The data were discussed thoroughly and analyzed by the study management committee to ensure validity.

Results

Fourteen occupational therapists agreed to participate (eight males, six females); all signed consent forms before participating in the study. Pseudonyms were used to protect the identity of the participants. Characteristics of the participants are presented in Table 2.

Table 2

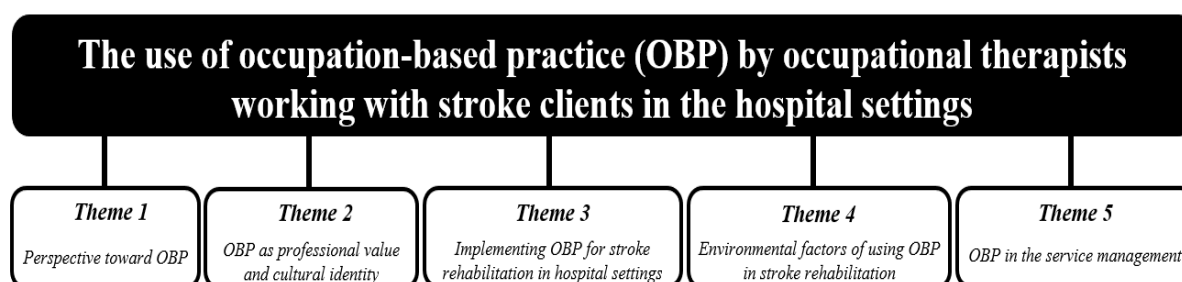
Demographic Characteristics of Participants in the Individual Interview

Description	
Gender	n (%)
Male	8 (57.14)
Female	6 (42.86)
Clinical setting	n (%)
-University hospital	5 (35.71)
- Public hospital	5 (35.71)
- Health institute	4 (28.58)
	Years
Age range	25-41
Experience in year range	3-19

Five themes were summarized in Figure 1, then were identified the details as the following:

Figure 1

Summary of Five Main Themes



Theme 1: Perspective Towards OBP in Stroke Rehabilitation

The occupational therapy for stroke patients reflected the understanding of OBP concerning clients' needs and the use of therapeutic occupations in the service process. The participants appeared to believe in the occupation in therapy and tried to utilize occupation in their daily practice. They selected occupations based on relevance and need, which led their responses to reflect an understanding of OBP and the benefits of using occupations therapeutically. The use of therapeutic activities was explicit in stroke rehabilitation. Akara indicated the link to everyday activities:

I see that the use of OBP helps my stroke client meet the need for a sense of achievement. stroke client wants to get dressed by himself at home. I use OBP as a framework for my practice... we chose activities as media for treatment. (Akara)

OBP was seen as a therapeutic approach that enabled clients to draw upon skills and occupational performance to fit their needs. One occupational therapist characterized OBP in her practice:

I felt that it is client-centered and is occupationally focused. I felt like it is a real occupational therapy because I get to promote my stroke client's potential by having conversations about occupations... I see that activities are important to the client, especially when used as a treatment approach. (Anong)

In Somchai, he summarized the importance of implementing OBP into occupational therapy:

In the past, we provided basic and functional rehabilitation that we have tools and facilities in occupational therapy clinics. A lot of times, the client's goals did not include occupational ones since we were employing impairment-based occupational therapy only. This is why we never think about the stroke clients' context. Impairment-based is still a predominant approach. Therefore, if we change our mindset to use the OBP, we will consider more the context of clients, family, and community. (Somchai)

The quote above demonstrates that the perspective towards OBP in stroke rehabilitation is generated from the nature of therapists. It provided OBP for clients with strokes in occupational therapy clinics. Participants' accounts of their experience with OBP reflect the effectiveness of this approach, which could help clients with strokes meet their needs and achieve their goals.

Theme 2: OBP as Professional Value and Cultural Identity

The occupational therapists agree that OBP construct, when applied in practice, promotes an occupational therapy service. The use of OBP contributes to professional value and identity. OBP principles can be readily applied to clients that are more meaningful and cultural influence within environments. Moreover, OBP allows for holistic care where occupational therapy services transcend beyond the hospital by drawing relevant everyday activities of the client to be a key approach. In this study, we found that participants reflected the use of OBP as a professional identity with value-added. This is evident in Prasert's responses:

I found that when using OBP, I feel that my real profession is coming...it helps my clients learn how to value not only their daily activities but also themselves... the fact that they even talk to me about their daily life is very telling that they are learning how to value their occupations... (Prasert)

Interview transcripts revealed how the participants observed the participation of clients in occupations that are not only meaningful but also culturally sensitive. Kanya recalled her practice experience:

I always view my clients based on what they have been doing before, what they can do now, and what they want to do in the future. As an occupational therapist, when I see them being able to perform activities but with a lack of quality, I take a step back by looking at their occupational profile... This allows me to reflect on what activities to provide them within the clinic... it matters when we train them in activities and occupations that are meaningful to them so that occupational participation can continue at home and in familiar environments. (Kanya)

While Kanya indicated that she uses an OBP approach, she asserted that she helps address her client's impairments to achieve engagement in occupation. One account recalled that promoting OBP to clients with stroke caused some resistance from their family members. However, persistence appeared to pay off later, as Dusit recounted:

When I first talked about the OBP approach to my clients and their family members, their responses were confusion and reluctance. However, with much persistence and staying true to OBP, my clients slowly appreciated the value of engaging in meaningful activities... (Dusit)

As illustrated above, participants implement OBP in a positive way that enhances occupational therapists' professional value. To meet the needs of clients with strokes, it is best practice to collaborate with therapists, clients, and their families to select purposeful and meaningful activities based on clients' values and culture.

Theme 3: Implementing OBP for Stroke Rehabilitation in Hospital Settings

Implementing OBP is an OT process that begins with an assessment to find out a client's skill and performance and focuses on occupational goals and intervention, which in turn, influence therapy outcomes. This understanding among OT participants promotes the importance of OBP implementation in OT service. OBP was seen as a therapeutic approach that enabled stroke clients to draw upon skills and occupational performance to fit their needs. One occupational therapist characterized the use of OBP in his practice:

I felt that it is client-centered and is occupationally focused. I tried to set up the goal by taking from the client's needs and what activities that he or she will be going to do at home. For example, my client needs to take shower by himself after discharge, I and my team evaluate performance and skills leading to set up the occupational goal that is about showering. I felt like it is a real occupational therapy because I get to promote my client's potential by having conversations about his outcome first [occupation]... I see that these activities will happen and are important to him, especially when used as a treatment approach. (Anong)

Dusit described OBP as part of the intertwined within the broad occupational therapy process, which starting from means (assessment and intervention) and end (outcome). As Dusit expressed:

I may see something that makes sense for the process to use OBP that includes three steps. The first is about what are the needs of my stroke clients related to their performance and skills, which I draw from the assessment. The second is to set up occupation-based goals relevant to what the clients want to do leading to the intervention. The third is about monitoring the outcomes that my clients engage in the occupation and the way to achieve. This is the OBP that affects change because it is based on what real activities they want to do and what ability to make the change. (Dusit)

Dusit mentioned that identifying “relevant occupation-based goals related to a client’s ability and needs” leads to occupation-based practice that Boonsri described how he had intervened with a stroke client by using OBP, which is highlighted in the following interview extracts:

I try to find something that makes my clients feel good about what they are doing activities. Usually, it is easy for me to find everyday life activities that they used to do. My stroke client wants to do toileting by himself. So, the occupational goal is that he is going to do toileting. The therapist should assess his functional skills and abilities related to toileting. If he cannot do it now, what is the functional capacity that the therapist must promote to meet the achievement. And then the therapist provided a toileting method for the intervention. Lastly, the therapist must evaluate the toileting outcome of a client. (Boonsri)

Participants claimed that OBP implementation in rehabilitation at hospitals was a challenge to accomplish with stroke clients. Incorporating OBP enabled occupational therapists to design stroke treatment goals and plans using occupation as an assessment, intervention, and outcome. A key principle in implementing OBP in stroke rehabilitation in the hospital setting was to enable clients to engage in everyday life activities based on their abilities and needs.

Theme 4: Environmental Factors of Using OBP in Stroke Rehabilitation

The findings presented participants based on clinical experiences in the use of OBP. The factors of using OBP are related to client-family context, environmental area of clinical setting that in turn influenced therapy outcomes. In the account of Akara and Malee, participants recognized the importance of an environment that would support the occupations undertaken as part of OBP that is evident in the following interview extracts:

I think that adequate space is a key factor in sustaining OBP... the director and team were concerned about the activity of daily living [ADL] room and rehabilitation space, especially the rooms used for transferring, dressing, eating, and toileting. (Akara)

When using OBP, the first thing to consider is the occupational therapy unit’s space. Does the space support or limit? When limited space does not allow for occupational performance and participation, my team and I will make ways to modify existing tools and environments to meet our clients’ needs... (Malee)

However, both Hathai and Somchai reflected that, at times, the environment does not support the unique needs of a stroke client:

I had an experience where a stroke client needed to practice driving a car, but my occupational therapy clinic lacked the space for training. This limited training opportunities... Hence, I suggested that the client, instead, practice how to transfer to get in and out of the car... (Hathai)

While the limited environment and equipment caused by a lack of budget, Prasert raised a potential solution to overcome this limitation through deliberate collaboration with the family:

We know that our hospital has a limited budget resulting from a lack of therapeutic tools for rehabilitation. Sometimes, the therapy tools that we have are not suitable for OBP. However, we must be deliberate in working with our client's families to help us provide whatever materials, tools, and support that they can bring to us [here] from their homes... (Prasert)

Among the participants, it was evident in their expressions how the family environment impacts OBP implementation:

I think a major factor is a client's family. Thai lifestyle and context are also major factors. Most care a stroke the client receives in our culture is seen as burdened (seen as burden ...) to the family from the time the patient gets up in the morning until going to bed for sleeping. Our cultural context might be a barrier to improve occupational performance as their family wants to do the occupation themselves rather than allow stroke clients to do them. Family members didn't provide an opportunity for a client to do the activity at home, because they were afraid of their grandparents taking a risk that could have a negative impact. (Khajee)

Based on the above quotes, participants reflected that clients were restricted in terms of space and the area available for activities. Using OBP for stroke rehabilitation required a hospital setting and environment that was conducive to the process. Activities of daily living and the use of equipment are likely to be off limits during stroke rehabilitation. Furthermore, family culture and home environment were influential factors in improving occupational performance.

Theme 5: OBP in the Service Management

Stroke rehabilitation involves a treatment plan that is complex and requires the expertise of healthcare professionals, such as physicians, physiotherapists, occupational therapists, speech-language pathologists, and others, to provide and monitor the necessary services. In occupational therapy service, the potential benefits to improve the basic daily activity, function, and specific abilities of stroke clients have been considered. The treatment scope, resources, frequency, and duration of OBP depend on the service management related to team and stroke client-to-therapist ratio. In Anong, she described that the occupational therapist is incorporated with the rehabilitation team to support stroke clients by sharing information and strategies to match collaborative goals and plans, which is evident in the following interview extracts:

Our team includes rehabilitation medicine specialists, nurses, physiotherapists, occupational therapists, and speech-language pathologists. We devise a care plan for a client by working together, sharing specific information about the case, and learning from, to, and about each other... (Anong)

In Hathai, there is also this reality where occupational therapists need to compete with other professionals for the time in providing OBP implementation. Hathai commented:

My clients receive not only occupational therapy, but also physical therapy, speech therapy, and group activities with nurses. This is why it is difficult to fully maximize the effects of OBP in the services that we provide... (Hathai)

Additionally, Khajee commented that the shortage of occupational therapists with the high number of cases further restricts the deliberate use of OBP in providing occupational therapy services. In other words, Khajee was alluding to the idea that the comprehensiveness of OBP was not always possible. She recounted:

This situation affects the quality of intervention and outcomes because we are limited to servicing our clients for only one hour... it means that in one day, OT is expected to handle around 15-20 clients... Integrating OBP into services is indeed challenging and impossible without implementing it into the hospital context... (Khajee)

In the quotes above, participants reflected that stroke rehabilitation was managed through a multidisciplinary approach. The OBP implementation was designed to provide clients with strokes greater outcomes by optimizing time management among the healthcare team. Additionally, due to the shortage of occupational therapists and the high number of clients with stroke, OBP was difficult to use. In turn, this may have an impact on the outcome and quality of the service.

Discussion

The findings in this study revealed a certain level of evidence demonstrating the use of OBP among Thai occupational therapists working in hospitals, specifically in stroke rehabilitation settings. Not only were the participants using OBP, but they also generally found that OBP responded to the needs of both clients and their families concerning the targeted occupational outcomes. Consequently, we believe that this piece of scholarship can inform Thai occupational therapists, professional societies, and institutes of higher learning about valuing occupational perspectives in client care, especially those with stroke.

Fisher (2014) asserted that the use of occupation throughout the evaluation and intervention process can result in specific occupational therapy outcomes. Several studies echoed this claim that considered OBP in providing meaning to interventions because the goals were based on the client's prioritized needs and context (Che Daud et al., 2016; Grice, 2015; Mulligan et al., 2014). Contrarily, OBP is not easy to apply consistently in occupational therapy. Apart from challenges due to temporal and spatial restrictions, the dissonance between "practice quality" through the use of occupations and "practice efficiency" using remediation approaches (Di Tommaso et al., 2019) as well as the medical hegemony engulfing occupational therapy practice in hospital settings make it difficult to maintain a consistent OBP among OTs

(Dhippayom, 2011; Hess-April et al., 2017). According to Galvin et al. (2011), the occupations in everyday practice were lack of visibility, which made it difficult to implement the human rights practice in the hospital context.

Using OBP solidified the professional identity among the participants who emphasized the use of occupation as the main element in how they go through the occupational therapy process—evaluation, intervention, and measuring outcomes. The study findings supported how OBP allowed occupational therapists to better express their professional identity and uniqueness that galvanize transformative practice (Hess-April et al., 2017). Additionally, apart from securing professional identity (Che Daud et al., 2016), OBP cultivates family-centered care approaches enabling occupational therapists to become more satisfied and fulfilled with their jobs (Estes & Pierce, 2012). Regarding clients, OBP fosters a client-centered care approach that targets better health outcomes and enhances the quality of life.

The integration of cultural contexts in occupational therapy has been intentionally considered throughout its domains and processes (American Occupational Therapy Association, 2020). Occupational therapists viewed humans as occupational beings. Individuals are embedded within cultural environments that afford the possibility to engage in their occupations. When discussing these factors, occupational therapists considered sociocultural factors including rules and regulations, attitudes and expectations, shared values and customs, and issues of diversity such as race, ethnicity, class, gender, sexual orientation, and ability (Hammell, 2013). By implementing OBP, participants were not only engaged in occupations but also activated culturally meaningful occupations for which clients are more responsive. Thai occupational therapists have documented how they were able to intersect culture and occupations. For instance, Thai occupational therapists have explored the use of food occupations, particularly highlighting ancient Thai food preparations among women during Songkran festival (Clair et al., 2004). Indeed, these are occupations underpinned by unique Thai culture but have shown inclusivity as they are being recognized and applied as part of OBP in other contexts.

Participants in this study expressed that the use of OBP enabled them to deliver their services through client- and family-centered approaches. Moreover, they reported that OBP allowed them to underscore the therapeutic use of activities of daily living and work to achieve their clients' occupational goals. This is supported by a survey study, which found activities of daily living, work, and instrumental activities of daily living as the top three most commonly used OT interventions in the physical rehabilitation setting in Thailand (Kaunnil et al., 2021).

However, it is important to note that in Thailand, the occupational goals of stroke clients are heavily influenced by their family's decisions and priorities (Nualnetr et al., 2010). While the family plays a significant role in improving the health disposition of a stroke client throughout the stage's rehabilitation, it was perceived that most family members had a lack of knowledge and relevant skills concerning home-based and reintegrative care (Intamas et al., 2021). Although Thai culture is generally considered Asian and non-Western, not all families adhere to dominant cultures such as collectivism. Using occupations grounded on the Asian culture is one of the many ways to espouse OBP among occupational therapists. By doing this, occupational therapists will be encouraged to enhance their competencies, which will allow them to consider nuanced views and understandings of occupation from a non-Western and decolonizing perspective (Lee, 2019). Hence, stroke rehabilitation in Thailand is not a client-centered approach, but also needs to collect information from family members and socio-cultural norms in the use of OBP.

In the studies (Bendz, 2003; Medin et al., 2006), stroke participants viewed that the rehabilitation program helps them to improve their body function, but they did not fully regain the ability to return to work. During a focus group interview, it revealed that various significant factors promote or delay a stroke client's return to work. A qualitative study found that stroke

participants experienced a lack of financial support, while impairments such as physical, cognitive, visual, perception, and communication problems were seen as barriers. Other considerations were interpersonal and therapy support after returning to work, organizational influences, work/job-specific issues, and psychological problems. These factors impact the stroke client's ability to achieve employment (Hartke et al., 2011). Hence, prevocational rehabilitation and return to work therapy for stroke clients need to be further studied. Future studies should explore and identify the work opportunities available to the client and determine the possible links that exist between the needs of employers and the employee (stroke clients) based on the potential and current performance levels needed to bridge any gaps between these needs.

In this study, the environment is fundamental to OBP implementation. The participants reflected that the environmental areas of the hospital and occupational therapy clinics were not designed for implementing occupations in practice related to clients' needs. According to Estes and Pierce (2012), occupational therapists commented that implementing OBP is difficult to practice in the clinical setting due to time and space limitations including environments that are not natural representations. Another view insists that barriers to using OBP include a lack of resources, equipment, and environmental context (Chisholm et al., 2004). Inconsistent with Malaysia, the implementation of occupation-based interventions is hindered by several factors, including the dominance of a biomedical model in practice contexts, insufficient reimbursement, time constraints, lack of equipment and resources, and a limited perspective of practice among occupational therapists (Che Daud et al., 2015). In our study, participants were working in a governmental organization; they tried to integrate impairment-based techniques and OBP in hospital settings and health institutes that created challenges due to restricted provisions.

The government of Thailand decided that every provincial governor is an executive officer in charge of overseeing all activities related to each province in an integrated way (Jongudomsuk & Srisasalux, 2012). In this policy, introducing models of health-care decentralization in the sub-district health promoting hospitals were transferred to municipality and the general hospital to the Provincial Administrative Organization. These primary healthcare facilities form a partnership with a provincial hospital and a municipality, which integrates work in homes and communities such as manpower, equipment, and instruments. This study found that occupational therapists addressed the stroke rehabilitation team to understand their roles in implementing their clients' occupation in practice services, but other health providers reflected their professional skills and goals. To meet the common purpose and clients' goals, the stroke rehabilitation team should provide an opportunity to share information and knowledge for multidisciplinary assessment, problem discussion, short-and long-term rehabilitation goal setting, treatment planning, and decision making (Tempest & McIntyre, 2006). Thai occupational therapists need to communicate with the interdisciplinary team to make them clear about the benefit of OBP for stroke rehabilitation. The use of OBP is relevant to the health condition, stage of recovery, potential, the needs of client and family, and expected to be able to perform meaningful occupations and activities at home and community. In accordance with Suddick and De Souza (2007), effective teamwork in neurorehabilitation is needed to focus on what benefits the client and committed to using clear communication to adopt collaborative goal strategies that can achieve desired outcomes.

This study explored the experiences of Thai occupational therapists in their use of OBP in stroke rehabilitation. OBP allowed Thai occupational therapists to solidify their professional identity and uniqueness as experts in improving clients' health and wellbeing through the therapeutic use of occupations. This study also recognized that the OBP approach is not without its implementation setbacks including perceptions like requiring much time, space-consuming,

and conflicting views on quality and efficiency. Our study findings further revealed the nuanced characteristics of OBP as an approach in occupational therapy practice in stroke rehabilitation, including the use of occupations as means and end to therapy, the intersection of occupations and culture through Asian-focused occupations, and the value of family and social environments in setting occupational goals. Our aim is for OBP approaches to not only use occupations as means and end in occupational therapy, but more so to allow occupational therapists to employ the art of human caring beyond disability—but through human doing.

From our point of view, these findings are not generalizable which is individualized to utilize OBP in stroke rehabilitation. Other barriers are different in the healthcare system, culture, and socio-economic norms. Some limitations need to be addressed for participants that served at public hospitals and located in the capital city of Thailand and outskirts area. In the future, the team envisages continued scholarship on OBP using a larger sample size. The method will include stroke clients and their family members. We will consider the occupational therapists across the six regions in Thailand who work in both rural and urban settings and in both private and public facilities. One approach to gaining a more comprehensive understanding of OBP implementation in stroke rehabilitation would be to interview members of the interdisciplinary team, as they can provide a holistic perspective on the subject from all stakeholders.

References

- American Occupational Therapy Association. (2020). Occupational therapy practice framework: Domain and process—Fourth edition. *The American Journal of Occupational Therapy*, 74(Supplement 2), 7412410010p1-7412410010p87. <https://doi.org/10.5014/ajot.2020.74s2001>
- Bendz, M. (2003). The first year of rehabilitation after a stroke - from two perspectives. *Scandinavian Journal of Caring Sciences*, 17(3), 215-222. <https://doi.org/10.3109/07380570903222583>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Bureau of Sanatorium and Art of Healing. (2022). *Number of art practitioners*. https://mrd.hss.moph.go.th/mrd1_hss/?p=6772
- Che Daud, A. Z., Judd, J., Yau, M., & Barnett, F. (2016). Issue in applying occupation-based intervention in clinical practice: A Delphi study. *Procedia - Social and Behavioral Sciences*, 222, 272-282. <https://doi.org/10.1016/j.sbspro.2016.05.158>
- Che Daud, A. Z., Yau, M., K., & Bernett, F. (2015). A consensus definition of occupation-based intervention from a Malaysian perspective: A Delphi study. *British Journal of Occupational Therapy*, 78(11), 697-705. <https://doi.org/10.1177/0308022615569510>
- Chisholm, D., Dolhi, C. D., & Schreiber, J. (2004). *Occupational therapy intervention resource manual: A guide for occupation-based practice*. Cengage Learning.
- Clair, V. W. S., Bunrayong, W., Vittayakorn, S., Rattakorn, P., & Hocking, C. (2004). Offerings: Food traditions of older Thai women at Songkran. *Journal of Occupational Science*, 11(3), 115-124. <https://doi.org/10.1080/14427591.2004.9686539>
- Dhippayom, J. (2011). *Independent living: The perspectives of occupational therapists in Thailand* [Doctoral dissertation, Cardiff University]. <https://orca.cardiff.ac.uk/id/eprint/54405/>
- Di Tommaso, A., Wicks, A., Scarvell, J., & Isabel, S. (2019). Experiences of occupation-based practice: An Australian phenomenological study of recently graduated occupational therapists. *British Journal of Occupational Therapy*, 82(7), 412-421. <https://doi.org/10.1177/0308022618823656>

- Edmans, J. (2010). *Occupational therapy and stroke*. Wiley Online Library.
- Estes, J., & Pierce, D. E. (2012). Pediatric therapists' perspectives on occupation-based practice. *Scandinavian Journal of Occupational Therapy*, 19(1), 17-25. <https://doi.org/10.3109/11038128.2010.547598>
- Fisher, A. G. (2014). Occupation-centred, occupation-based, occupation-focused: Same, same or different? *Scandinavian Journal of Occupational Therapy*, 21(sup1), 96-107. <https://doi.org/10.3109/11038128.2014.952912>
- Galvin, D., Wilding, C., & Whiteford, G. (2011). Utopian visions/dystopian realities: Exploring practice and taking action to enable human rights and occupational justice in a hospital context. *Australian Occupational Therapy Journal*, 58(5), 378-385. <https://doi.org/10.1111/j.1440-1630.2011.00967.x>
- Giacomin, M., & Jordan, C. (2017). Interdependent and independent self-construal. In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of personality and individual differences* (pp. 1-7). Springer International Publishing.
- Gray, J. M. (1998). Putting occupation into practice: Occupation as ends, occupation as means. *American Journal of Occupational Therapy*, 52(5), 354-364. <https://doi.org/10.5014/ajot.52.5.354>
- Grice, K. O. (2015). The use of occupation-based assessments and intervention in the hand therapy setting - a survey. *Journal of Hand Therapy*, 28(3), 300-306. <https://doi.org/10.1016/j.jht.2015.01.005>
- Hammell, K. R. (2013). Occupation, well-being, and culture: Theory and cultural humility. *Canadian Journal of Occupational Therapy*, 80(4), 224-234. <https://doi.org/10.1177/0008417413500465>
- Hartke, R. J., Trierweiler, R., & Bode, R. (2011). Critical factors related to return to work after stroke: A qualitative study. *Topics in Stroke Rehabilitation*, 18(4), 341-351. <https://doi.org/10.1310/tsr1804-341>
- Helene, G.-L., Amy, K., & Doris, P. (2003). A study of occupation-based practice. In D. E. Pierce (Ed.), *Occupation by design: Building therapeutic power* (pp. 239-261). F. A. Davis Company.
- Hess-April, L., Ganas, N., Phiri, L., Phoshoko, P., & Dennis, L. (2017). Occupation-based practice in a tertiary hospital setting: Occupational therapists' perceptions and experiences. *The South African Journal of Occupational Therapy*, 47(3), 25-31. <https://doi.org/10.17159/2310-3833/2017/v47n3a5>
- Hocking, C. (2001). Implementing occupation-based assessment. *The American Journal of Occupational Therapy*, 55(4), 463-469. <https://doi.org/10.5014/ajot.55.4.463>
- Intamas, U., Rawiworrakul, T., Amnatsatsue, K., Nanthamongkolchai, S., & Palmer, M. H. (2021). Care of stroke survivors in community: A case study of rural Thai community. *Journal of Health Research*, 35(1), 77-87. <https://doi.org/10.1108/jhr-07-2019-0172>
- Jongudomsuk, P., & Srisasalux, J. (2012). A decade of health-care decentralization in Thailand: What lessons can be drawn? *WHO South-East Asia Journal of Public Health*, 1(3), 347-356. <https://doi.org/10.4103/2224-3151.207031>
- Kantamaturapoj, K., Kulthanmanusorn, A., Witthayapipopsakul, W., Viriyathorn, S., Patcharanarumol, W., Kanchanachitra, C., Wibulpolprasert, S., & Tangcharoensathien, V. (2020). Legislating for public accountability in universal health coverage, Thailand. *Bulletin of the World Health Organization*, 98(2), 117-125. <https://doi.org/10.2471/blt.19.239335>
- Kaunnil, A., Khemthong, S., Sriphetcharawut, S., Thichanpiang, P., Sansri, V., Thongchoomsin, S., Permpoonputtana, K., & Smith, C. R. (2021). Occupational therapists' experiences and perspectives towards occupation-based practice in

- Thailand: A mixed-methods study. *British Journal of Occupational Therapy*, 84(1), 54-64. <https://doi.org/10.1177/0308022620910402>
- Khayat-zadeh Mahani, M., Hassani Mehraban, A., Kamali, M., & Parvizy, S. (2015). Facilitators of implementing occupation based practice among Iranian occupational therapists: A qualitative study. *Medical Journal of the Islamic Republic of Iran*, 29, 307-307.
- Kielhofner, G. (2008). *Model of human occupation: Theory and application*. Lippincott Williams & Wilkins.
- Langhorne, P., & Pollock, A. (2002). *What are the components of effective stroke unit care?* Oxford University Press.
- Lee, B. D. (2019). Scoping review of Asian viewpoints on everyday doing: A critical turn for critical perspectives. *Journal of Occupational Science*, 26(4), 484-495. <https://doi.org/10.1080/14427591.2019.1598475>
- Legg, L. A., Lewis, S. R., Schofield-Robinson, O. J., Drummond, A., & Langhorne, P. (2017). Occupational therapy for adults with problems in activities of daily living after stroke. *Stroke*, 48(11), e321–e322. <https://doi.org/10.1161/strokeaha.117.018923>
- Luft, A., & Katan, M. (2018). Global burden of stroke. *Seminars in Neurology*, 38(2), 208–211. <https://doi.org/10.1055/s-0038-1649503>
- Medin, J., Barajas, J., & Ekberg, K. (2006). Stroke patients' experiences of return to work. *Disability and Rehabilitation*, 28(17), 1051–1060. <https://doi.org/10.1080/09638280500494819>
- Mohammed Alotaibi, N., Reed, K., & Shaban Nadar, M. (2009). Assessments used in occupational therapy practice: An exploratory study. *Occupational Therapy in Health Care*, 23(4), 302–318. <https://doi.org/10.3109/07380570903222583>
- Mulligan, S., White, B. P., & Arthanat, S. (2014). An examination of occupation-based, client-centered, evidence-based occupational therapy practices in New Hampshire. *OTJR Occupation, Participation and Health*, 34(2), 106-116. <https://doi:10.3928/15394492-20140226-01>
- Nualnetr, N., Srisoparb, W., & Eungpinichpong, W. (2010). The application of community neurorehabilitation using a family-centred approach to persons with disability: A case study in stroke survivors. *Asia Pacific Disability Rehabilitation Journal*, 21(1), 71-79.
- Skubik-Peplaski, C., Custer, M., Powell, E., Westgate, P. M., & Sawaki, L. (2017). Comparing occupation-based and repetitive task practice interventions for optimal stroke recovery: A pilot randomized trial. *Physical & Occupational Therapy in Geriatrics*, 35(3-4), 156-168. <https://doi.org/10.1080/02703181.2017.1342734>
- Spalding, K., Gustafsson, L., & Di Tommaso, A. (2020). Occupation-based group programs in the inpatient hospital rehabilitation setting: A scoping review. *Disability and Rehabilitation*, 44(10), 2138-2148. <https://doi.org/10.1080/09638288.2020.1813818>
- Srikhamjak, T., Yanawuth, K., Sucharittham, K., Larprabang, C., Wangsattabongkot, P., Hauwadhanasuk, T., Thawisuk, C., Thichanpiang, P., & Kaunnil, A. (2022). Impact of the COVID-19 pandemic on mental health and lifestyle in Thai occupational therapy students: A mixed method study. *European Journal of Investigation in Health, Psychology and Education*, 12(11), 1682-1699. <https://doi.org/10.3390/ejihpe12110118>
- Suddick, K. M., & De Souza, L. H. (2007). Therapists' experiences and perceptions of teamwork in neurological rehabilitation: Critical happenings in effective and ineffective teamwork. *Journal of Interprofessional Care*, 21(6), 669-686. <https://doi:10.1080/13561820701722634>
- Tempest, S., & McIntyre, A. (2006). Using the ICF to clarify team roles and demonstrate clinical reasoning in stroke rehabilitation. *Disability and Rehabilitation*, 28(10), 663-

667. <https://doi:10.1080/09638280500276992>
- Tomori, K., Nagayama, H., Nagatani, R., Ohno, K., Saito, Y., Takahashi, K., Sawada, T., & Higashi, T. (2015). Comparison of occupation-based and impairment-based occupational therapy for subacute stroke: A randomized controlled feasibility study. *Clinical Rehabilitation*, 29(8), 752-762. <https://doi:10.1177/0269215514555876>
- Twinn, D. S. (1998). An analysis of the effectiveness of focus groups as a method of qualitative data collection with Chinese populations in nursing research. *Journal of Advanced Nursing*, 28(3), 654-661. <https://doi:10.1046/j.1365-2648.1998.00708.x>
- Wolf, T. J., Chuh, A., Floyd, T., McInnis, K., & Williams, E. (2015). Effectiveness of occupation-based interventions to improve areas of occupation and social participation after stroke: An evidence-based review. *American Journal of Occupational Therapy*, 69(1), 1-14. <https://doi:10.5014/ajot.2015.012195>

Author Note

Anuchart Kaunnil is a lecturer in the Department of Occupational Therapy, Faculty of Associated Medical Sciences, Chiang Mai University, Thailand. He graduated with a doctorate in occupational therapy from Northumbria University, United Kingdom. He is the primary investigator and first author. His work included conceptualization, writing a research proposal, methodology, project administration, resources, preparing ethical submissions, investigation, conducting interviews, data curation, data analysis, writing—original draft, and revising the manuscript.

Veerawat Sansri is a lecturer of anatomy for medical students in Department of Basic Medical Science, Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Thailand. His work included conceptualization, resources, and data curation.

Surachart Thongchoomsin is a lecturer in the Division of Occupational Therapy, Faculty of Physical Therapy, Mahidol University, Thailand. His work included conceptualization, resources, and data analysis.

Kannika Permpoonputtana is an assistant professor in National Institute for Child and Family Development, Mahidol University, Thailand. Her work included conceptualization, resources, and data curation.

Sutinun Juntorn is a lecturer in the Division of Occupational Therapy, Faculty of Physical Therapy, Mahidol University, Thailand. Her work included conceptualization, resources, and data analysis.

Kathryn Jarvis is a senior research fellow, Stroke Team, School of Nursing, Senior Lecturer in Occupational Therapy and Professional Lead for Occupational Therapy School of Sport and Health Sciences, University of Central Lancashire, UK. Her work included conceptualization, validation, and writing-review.

Cristina Reyes Smith is an associate professor and director of admissions in the College of Health Professions (CHP) Division of Occupational Therapy at the Medical University of South Carolina (MUSC), USA. She graduated with a Doctor of Occupational Therapy (OTD) from Thomas Jefferson University, Philadelphia. Her work included conceptualization and validation.

Michael Palapal Sy is an associate professor of Health Professions Education, University of the Philippines Manila. He graduated with a Doctor of Occupational Therapy from Tokyo Metropolitan University, Japan. His work included conceptualization, validation, and writing-review.

Jiranan Griffiths is an assistant professor in the Department of Occupational Therapy, Faculty of Associated Medical Sciences, Chiang Mai University. She graduated with a

doctorate in community medicine from the Faculty of Medicine, Chiang Mai University. Her work included conceptualization, validation, and writing-review.

Chutikorn Nopparat is a lecturer in the Innovative Learning Center, Srinakharinwirot University, Thailand. His work included conceptualization and validation.

Peeradech Thichanpiang, is an assistant professor in the Division of Occupational Therapy, Faculty of Physical Therapy, Mahidol University, Thailand. He graduated with a doctorate in Anatomy and Structural Biology from Mahidol University. He is the manuscript's corresponding author. He conducted project administration, resources, preparing ethical submissions, investigation, conducting interviews, data curation, data analysis, writing—original draft, and revising the manuscript. Please direct correspondence to peeradech.thi@mahidol.ac.th

Acknowledgments: The authors would like to thank all participants (occupational therapy practitioners) for participating and sharing their experience.

Funding: Research team would like to thank the research the New Research Grant, Faculty of Physical Therapy, Mahidol University, Thailand [Grant 0517.391 (4.2)/027, 2015] for this opportunity. The funding body had no role in the design of the study, collection, analysis, interpretation of data, and writing the manuscript.

Authors' Contributions: authors contributed to the stages. Authors revised the manuscript, agreed to be fully accountable for ensuring the integrity and accuracy of the study, and read and approved the final version of the manuscript to be published. All the authors met the criteria for authorship, and they are listed as co-authors on the title page.

Copyright 2023: Anuchart Kaunnil, Veerawat Sansri, Surachart Thongchoomsin, Kannika Permpoonputtana, Sutinun Juntorn, Kathryn Jarvis, Cristina Reyes Smith, Michael Palapal Sy, Jiranan Griffiths, Chutikorn Nopparat, Peeradech Thichanpiang, and Nova Southeastern University.

Article Citation

Kaunnil, A., Sansri, V., Thongchoomsin, S., Permpoonputtana, K., Juntorn, S., Jarvis, K., Smith, C. R., Sy, M. P., Griffiths, J., Nopparat, C., & Thichanpiang, P. (2023). Delivering occupation-based practice in stroke rehabilitation of hospital settings: Thai occupational therapists' experiences. *The Qualitative Report*, 28(1), 252-268. <https://doi.org/10.46743/2160-3715/2023.5591>
