



*Special Collection: Short Report*

## Remote Home Environment Assessment (RHEA) Framework

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### Abstract

The Remote Home Environment Assessment (RHEA) Framework is a guide designed to help therapists conduct structured home environment assessments remotely using tools and technology. It offers an efficient and practical approach to overcoming the limitations of facility-based home assessments. The framework offers step-by-step procedures for remote home environment assessment for adult clients with physical dysfunction. It involves four major steps that focus on assessing the client's physical environment: a) screening for selecting the most appropriate remote home environment assessment modality/ies; b) a preparatory phase that includes signing consent forms, explaining the assessment process, and previewing preliminary information; c) administration of the remote assessment; and d) consolidation of the home information. Furthermore, supplementary materials such as screening form, client and health facility consent forms, home evaluation questionnaire and checklist, and client instructions were developed to facilitate and guide the implementing therapist through the aforementioned steps. Pilot testing is recommended to gain accurate and practical insights into the RHEA Framework's usability and effectiveness.

**Keywords:** Home environment, Remote assessment, Home environment assessment, Home assessment, Assessment, Occupational Therapy

### BACKGROUND

Effectively assessing home environments from clinics, centers, and hospitals poses a challenge for Filipino Occupational Therapy (OT) practitioners due to pragmatic and policy restrictions that prevent them from physically visiting the client's home. Moreover, such health facilities seldom engage third-party OT home service providers to outsource home evaluation services. Hence, home assessments, particularly those based on unstructured interviews and procedures, have a limited ability to understand the physical home environment and its impact on the client's safety and independence during meaningful activities.<sup>1</sup>

Without structured protocols for home assessments, OT practitioners will find it difficult to comprehensively identify potential hazards in

the client's home, leading to generic recommendations for home modifications. Consequently, clients may not receive the individualized support necessary, increasing their risk, reducing their independence, and adding pressure on caregivers.<sup>2</sup>

The Remote Home Environment Assessment (RHEA) Framework is a guide designed to help therapists conduct structured home environment assessments remotely using tools and technology whenever possible. By leveraging technology and a methodical approach, the framework aims to overcome the constraints of unstructured facility-based assessments, making them more holistic, client-centered, and effective for informing individualized recommendations.<sup>1,3</sup>

The framework offers step-by-step procedures for remote home environment assessment for adult clients with physical dysfunction. The protocols offered are envisioned to succeed in the therapist's conduct of anthropometric measurements and objective assessments of client factors such as cognition and sensorimotor functions utilizing appropriate tools and methods that are accessible to them. It is surmised that such procedures can be more feasibly conducted with the client within the facility. The RHEA involves a process consisting of four major steps that focus on assessing the client's physical environment. It aims to yield information that can ultimately help the therapists foster a person-environment fit that promotes occupational performance. The RHEA process entails screening for selecting the most appropriate remote home environment assessment modality/ies; a preparatory phase that includes signing consent forms, explaining the assessment process, and previewing preliminary information; administration of the remote assessment; and consolidation of the home information.

Client-caregiver collaboration is crucial throughout the remote home environment assessment. This client-caregiver relationship equips therapists with the information and insight to address environmental barriers and recommend supports that enhance the client's safety, independence, and quality of life.<sup>1</sup>

## OBJECTIVES

This framework aims to achieve three core objectives that address the limitations of facility-based home assessments:

1. To identify barriers to effective remote home environment assessment.
  - Through structured, remote assessments, OT clinicians can better understand the challenges of specific parts of the home environment to the client's needs. The framework seeks to determine critical obstacles that hinder efficient and thorough home assessments, such as the inability to observe spatial constraints and client mobility.

2. To define critical factors for effective remote home environment assessment.
  - This framework highlights the critical factors needed for a comprehensive remote home assessment. By focusing on these factors, necessary steps will be included to ensure an accurate and effective remote home assessment.
3. To establish clear, actionable steps for remote home environment assessment.
  - The framework provides OT practitioners with a systematic approach for conducting thorough remote home assessments. Each step ensures the collection of necessary information, even from a distance, and accurately observes challenges and environmental demands.

## THEORETICAL BASES

The Remote Home Environment Assessment (RHEA) Framework is a robust resource designed to help assess home environments remotely, particularly for adult clients with physical dysfunction. Its development draws on various established theoretical bases and assessment tools to create a comprehensive, effective, and client-centered approach.

The framework adapted and integrated components from three different home evaluation tools, namely Westmead Home Safety Assessment Short Form (WeHSA), Home Safety Self-Assessment Tool Version 5 (HSSAT V-5), and Home Environment Assessment Protocol-Revised (HEAP-R) to create a home assessment tool under this framework. These are selected due to their good psychometric properties, as well as their accessibility through numerous research platforms.<sup>4,5,6</sup> The adaptation methods employed in developing the framework's home environment assessment tool included selecting items from the aforementioned Western assessment tools that were most relevant to the Philippine context. Furthermore, elements such as identifying hazards, visual cues or clutter, presence of adaptations, and measurements of specific parts of the house were integrated into a single checklist.

The framework borrows from the Protocol for Administering Telehealth Home (PATH) Assessment to address the methodological approach. The PATH protocol provides a structured and validated approach for synchronous home assessments. The RHEA Framework adapts several components from PATH, including the initial screening for telehealth appropriateness, completing an occupational profile, and using supplemental resources, ensuring a well-rounded preparatory phase and seamless integration of telehealth practices.

Another foundational element is the Person-Environment-Occupation-Performance (PEOP) Model. This model highlights the interplay between intrinsic and extrinsic factors that impact everyday occupations, emphasizing the relationship between personal factors, environmental factors, and occupational performance.<sup>7</sup> Influenced by the PEOP model, the RHEA Framework acknowledges how environmental barriers can hinder occupational performance and how enablers can support client engagement and independence.

Lastly, the framework aligns with the Occupational Therapy Practice Framework: Domain and Process-IV (OTPF-IV), which emphasizes a client-centered approach throughout the therapy process. The OTPF-IV underscores the importance of context in occupational performance and the role of performance skills and patterns in achieving success. The RHEA Framework adapts the OTPF-IV's evaluation process, including screening, profile establishment, direct observation, and synthesis of collected information, ensuring a holistic and individualized assessment for each client.

The Remote Home Environment Assessment Framework integrates the established theoretical models and assessment tools to offer a comprehensive, client-centered, and effective approach to remote home environment assessments. By doing so, it addresses the limitations of traditional facility-based assessments and enhances occupational therapists' ability to make individualized recommendations that promote safety, independence, and quality of life for their clients.

After writing the initial draft of the paper, the researchers sought guidance from the last author and two external reviewers to improve the paper's rigor and trustworthiness.

## DISCUSSION

### Barriers and Influencing Factors

Several factors influence the success of a remote home environment assessment, such as follows:

- **Client-Related Factors**
  - Acceptance and Trust. Concerns with data security, healthcare providers' qualifications, remote consultations' effectiveness, and adopting novel technology must be addressed to gain the clients' willingness to use remote services.<sup>8,9</sup>
  - Social Influence. Positive referrals may encourage utilization, while negative perceptions may result in hesitancy by the client and/or caregiver (Client's Perspective).<sup>8</sup>
  - Knowledge. Client engagement with these services may be affected by difficulty navigating their devices, using websites, and communicating effectively with providers through virtual platforms.<sup>3,8</sup>
  - Access to Technology. Clients need access to a reliable internet connection, mobile load availability, and compatible devices to participate in remote consultations.<sup>8</sup>
- **Therapist-Related Factors**
  - Availability and Acceptance. The availability of willing practitioners to provide remote services can influence feasibility. Potential barriers include securing credentialed practitioners, managing the capacity limits of distant providers, and navigating healthcare networks.<sup>9,10</sup>
  - Knowledge, Training, and Access. Therapists should be adequately trained in using relevant tools and technologies to perform remote services, working with distant providers, and incorporating

remote encounters into their workflow.<sup>3,8,10</sup> An advantage is for therapists who have access to psychometrically sound assessment tools that yield objective data such as space and object measurements and dimensions.

- Perception Towards Remote Methods. Therapists' biases, confidence, and hesitancy towards remote methods significantly impact the effectiveness of using remote methods for assessment.<sup>8</sup>
- Social Influence. Favorable opinions and optimistic experiences of the therapist's colleagues and professional networks may influence the therapist's decisions to offer remote services.<sup>8</sup>
- **Facility-Related Factors**
  - Performance and Effort Expectancy. Facilities would be more inclined to adopt remote methods if they believe this can expand access to care, improve client outcomes, and enhance operational efficiency.<sup>8</sup>
  - Workflow. Changes in facility workflows are bound to change when remote services are integrated, including adding staff responsibilities, education and training on using technologies, and community outreach on remote delivery services.<sup>9</sup>
  - Infrastructure. Modifications to the facility's infrastructure may be required to adopt remote services, including technical and physical changes.<sup>9</sup>
  - Cost and Sustainability. The high cost of procuring technological equipment and potentially low patient use can negatively impact the facility's financial performance.<sup>9</sup>

### **Steps of the Remote Home Environment Assessment**

The Remote Home Environment Assessment (RHEA) Framework offers a flexible, four-step approach for occupational therapists to conduct remote assessments of clients' home environments, ensuring an effective assessment

process. The framework comprises four steps: Screening, Preparatory Phase, Home Analysis, and Synthesis and Documentation. A model of the framework is provided below to offer a visualization and summary of the steps of RHEA (see Figure 1). Ideally, this four-step process is carried out over two days, with one hour dedicated to each day, following the standard practices typically found in health facilities.<sup>2,11</sup> Nonetheless, therapists can adjust the frequency and duration of sessions as needed, in agreement with the client and facility. Additionally, the steps may be repeated based on the clinical judgment of the therapists, allowing for a comprehensive assessment of the client's home environment.

#### **Step 1: Assessment Method Selection (Screening Client Information & Consent).**

This step involves reviewing client demographic information (e.g., name, age, diagnosis, address, contact information) and occupational and medical profile, which can be sourced from the OT charts and other professionals working with the client, such as his doctors, nurses, caregivers, physical and speech therapists. Such information may include the client's anthropometric measurements, physical, sensorimotor, and cognitive-perceptual functions, determining the most appropriate remote evaluation modality available, and obtaining consent from the client and/or the caregiver. A screening form with questions that are answerable by Yes, No, or Unsure is included in the supplementary files (see Supplemental File A) to guide the implementing therapist. Screening can be administered to the client referred for a home evaluation by the therapist. After the completion of the screening form and selection of the remote assessment method/s for the client, the therapist will obtain consent to conduct the home evaluation detailing the purpose, procedures, spatial requirements, and expected outcomes of the home evaluation found in the supplementary files (see Supplemental File B).

Using the screening form, the client's technological readiness and willingness will be determined, allowing the therapist to choose which of the remote home assessment method/s discussed below is the most appropriate and feasible.

- **Synchronous methods** via applications or platforms with video call features, such as Zoom, offer real-time interaction and allow thorough client observation in their natural environment. This method provides direct observation of the client's physical environment; however, it requires access to more efficient technology and stable internet connectivity for both the client and the therapist. It also includes phone interviews where the therapist and client discuss the home environment by describing the layout and potential hazards.
- **Asynchronous methods** include questionnaires, checklists, video recordings, photographs, emails, and text messages, which are used to evaluate the client's home environment. This method allows the therapist to review the materials at their convenience but limits real-time observation and interaction with the client's performance.

**Step 2: Preparatory Phase (Health Facility Consent, Tool Acquisition, Client Orientation).** This step involves three substeps to prepare the health facility, the therapist, and the client for the remote home environment evaluation. Each substep may be done synchronously and/or asynchronously, as agreed upon by the client and the therapist.

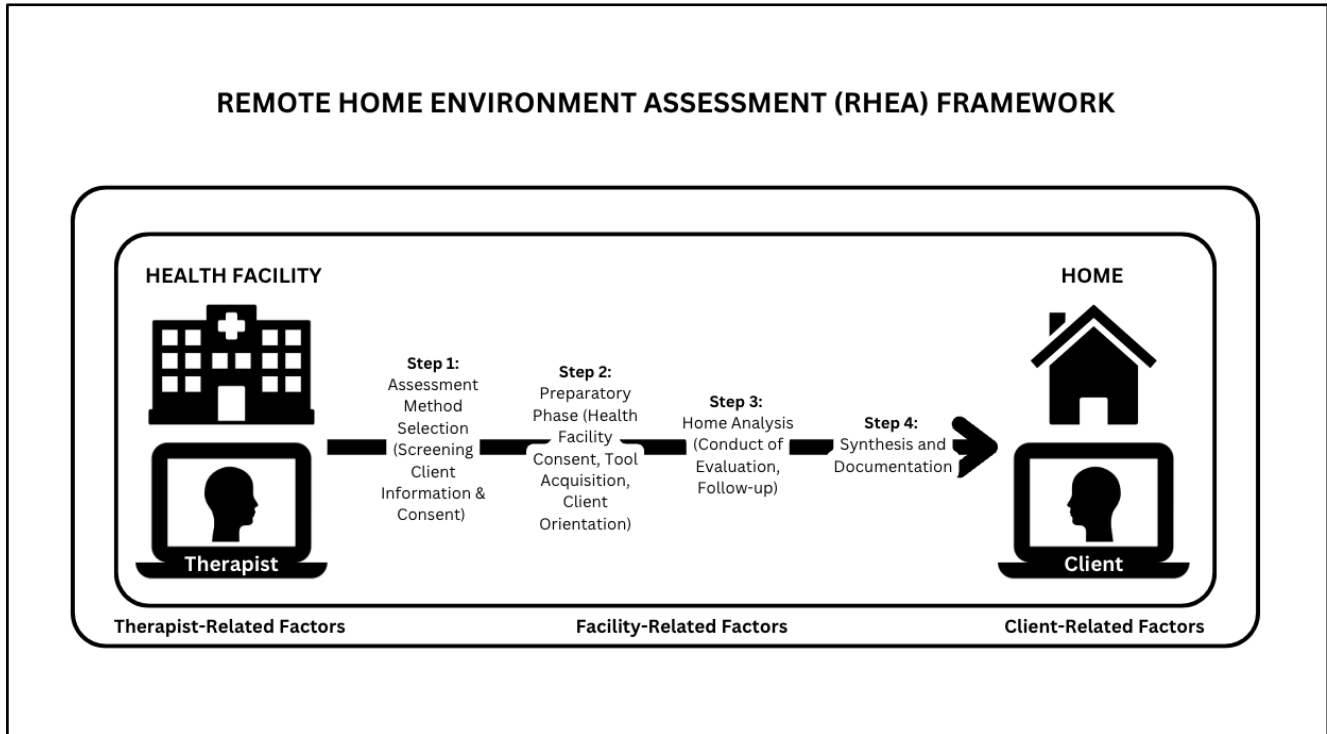
In **Substep 1**, the therapist will coordinate with the health facility to use its premises during the evaluation. Necessary consent will be obtained from the health facility to ensure proper setup of the assessment environment, printing of forms, preparation of required materials, and amenities such as internet and gadgets as needed. A consent form detailing the purpose, procedures, spatial requirements, and expected outcomes of the home evaluation may be accomplished (see Supplemental File C) and submitted to the health facility administration.

In **Substep 2**, the therapist would have already obtained the consent of the client, family, and health facility to use the appropriate and accessible assessment methods. The therapist can then obtain the appropriate, valid, and reliable tools for the remote home assessment methods to be used. Among such tools include the In-Hope Occupational Performance

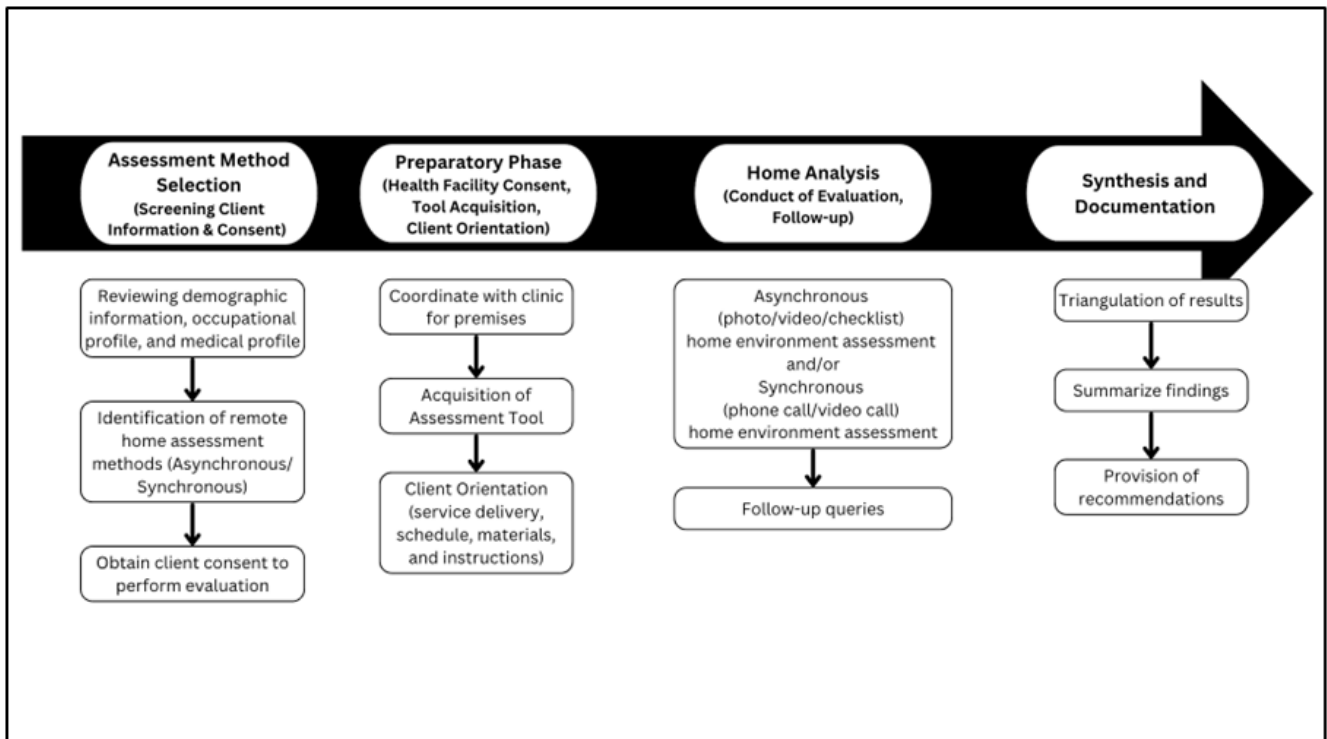
Evaluation (I-HOPE)<sup>12</sup> and the Safety Assessment of Function and the Environment for Rehabilitation - Health Outcome Measurement and Evaluation (SAFER HOME)<sup>13</sup>. Aware that such tools are not always readily available and may often require specialized training, the RHEA recommends the use of the Home Environment Questionnaire and Checklist (see Supplemental File D), which has been adapted from WeHSA, HSSAT V-5, and HEAP-R by assessing the rooms in a house in terms of hazards, adaptations, visual cues, and clutter.

In **Substep 3**, the client will be oriented and instructed on the appropriate and feasible remote assessment methods prior to the Home Analysis. This may involve setting schedules, preparing the materials, providing client or caregiver education on the use of technology as needed, and instructing how to capture the home environment (see Supplemental File E). This will help minimize inconveniences and optimize the therapist's and client's time during the Home Analysis.

**Step 3: Home Analysis (Conduct of Evaluation, Follow-up).** This step may be conducted through asynchronous (photos, videos, text message, encrypted email) and/or synchronous (video conference and audio call) methods. It involves two substeps to evaluate the home environment comprehensively. In **Substep 1**, the therapist administers the chosen home evaluation tool/s, such as the Home Environment Questionnaire and Checklist, to evaluate the home environment synchronously and/or asynchronously. Using this checklist, the client's perceived barriers and the home environment will be assessed in terms of the presence of hazards, adaptations, visual cues, and clutters in the environment. The client will also be asked to measure parts of the environment if feasible. Synchronous assessment methods can be done via phone calls or video conferencing. For the asynchronous evaluation, the client or caregiver may be asked to capture their environment using photos or videos and/or accomplish self-administered home assessment questionnaires, following the instructions provided during the preparatory phase. The therapist may then record findings gathered from the aforementioned methods on the Home Environment Questionnaire and Checklist.



**Figure 1.** Remote Home Environment Assessment Framework Model



**Figure 2.** Remote Home Environment Assessment Framework Process

In **Substep 2**, the therapist provides follow-up questions and clarifications that might have yet to be obtained from the initial substep. This can be done via synchronous or asynchronous methods.

**Step 4: Synthesis and Documentation.** The therapist triangulates and interprets the collected documents and reports from other health professionals, data from interviews, visual materials, questionnaires, checklists, and other assessment tools such as surveys or standardized scales that were administered. The results of the assessment will be explained to the client and/or caregiver, including recommendations. Areas of the home that require physical modifications will be highlighted. This could be done by making a comprehensive report starting with a shortlist of the obstacles in the various rooms/areas that hinder the client's occupational functioning. Subsequently, the therapist will summarize findings and provide recommendations that will help all the individuals involved in the client's care in planning specific interventions.

## RECOMMENDATIONS

Pilot testing is recommended to gain accurate and practical insights into the RHEA Framework's usability and effectiveness.

The RHEA is meant to be used in conjunction with standardized and sound home environmental assessment tools. In developing countries where access to such tools can be difficult, the RHEA presents the Home Evaluation Questionnaire and Checklist, which was informally adapted from Western tools such as the WeHSA, HSSAT V-5, and HEAP-R. It is acknowledged that the said instruments would benefit from undergoing validity and reliability testing. Hence, when used in the Philippines, this framework can potentially offer more reliable results if the said home environment assessment tools are contextualized to the Philippine setting.

The results obtained from evaluating the physical environment of a client's home must be triangulated with the client's information, such as anthropometric measurements and occupational profile obtained from available documents, to craft the most individualized and

specific recommendations, such as home modifications. Moreover, the framework focuses on assessing the physical environment only but acknowledges that other factors may affect the client, such as the social environment.

Since most households in developing countries such as the Philippines are in middle to low-socioeconomic areas, therapists may collaborate with local community centers to give clients, and their families access to devices and internet connection that will make synchronous home analysis methods such as video conferencing more feasible. Collaboration with local healthcare providers and community organizations may facilitate referrals, provide follow-up care, and ensure optimal client outcomes. RHEA is also more likely to be more reliable if the therapist assists the clients in answering questions and conducts the questioning themselves so as to explain any misunderstandings along the way. It is also recommended that therapists must be adequately trained in conducting home assessments, using relevant technologies, and working with clients virtually. Naturally, therapists must demonstrate an understanding of privacy and legal issues, professionalism, ethics, communication, and interpersonal skills.

Although many of the general processes and principles of the RHEA Framework can be applicable to populations other than adults with physical dysfunctions, further study is recommended for it to be more sensitive to the unique situation and needs of other groups, such as pediatric age groups and adults with psychosocial dysfunction. The assessment of other aspects of the environment, such as the social, cultural, socioeconomic, and institutional environment, can be included or addressed in future studies. Furthermore, the framework does not delve into the processes succeeding in the remote home evaluation, which presents another area for study. In conclusion, the Remote Home Environment Assessment Framework offers an efficient and practical approach to overcoming the limitations of facility-based home assessments.

## Supplementary Files

[Supplementary Files A-E. RHEA Framework](#)

## Individual Author's Contributions

All authors contributed equally.

## Disclosure Statement

All authors declared no conflict of interest. However, this paper is a requirement for specific coursework under the MSOT program of the University of Santo Tomas.

## Conflicts of interest

The authors of this paper declare no conflict of interest.

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