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# The Person–Environment Profile: Preliminary Development of a Clinical Tool for Enhancing Goal-Based Rehabilitation Programs

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**ABSTRACT:** The World Health Organization's International Classification of Functioning, Disability and Health identifies environmental and personal factors as contextually relevant to functioning following disability. Goal setting is also central to rehabilitation practice and enhances functioning. No current assessment exists that recognizes the interaction of environmental factors as they relate to goal setting in rehabilitation. The person–environment profile (PEP) was developed to explore an individual's subjective view of personal and environmental factors on the achievement of rehabilitation goals. A draft PEP underwent initial face validity testing, and the resulting version was then piloted with 13 participants across 34 rehabilitation goals within a goal-based community rehabilitation setting. Results of this pilot suggest that PEP may have the ability to detect differences in perceived barriers and facilitators across personal and environmental factors for different rehabilitation goals. While showing promise as a clinical tool, the pilot identified feasibility concerns over implementation as a standardized assessment. Substantial additional psychometric evaluation and testing needs to be undertaken before the tool can be recommended for clinical use.

**KEYWORDS:** goal setting, ICF, person, environment, assessment, rehabilitation

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## Introduction

With adoption of the World Health Organization's International Classification of Functioning, Disability and Health (ICF),<sup>1</sup> environmental factors are now fundamental to contemporary rehabilitation research and practice.<sup>2</sup> The five environment chapters of the ICF provide detailed classification of the physical environment (both natural and human made): products and technology; the social environment (family, social supports, and relationships); attitudes (of key people, significant others, and community members); and the service environment, as well as broader systems and policies, which may influence participation outcomes.<sup>3</sup> Contemporary research highlight aspects of this environmental taxonomy, which may act as barriers or facilitators depending on the functional needs of each individual.<sup>2,4–10</sup>

Several instruments have been developed to record and quantify the impact of environmental factors on functional outcomes. These instruments include the Craig Hospital Inventory of Environmental Factors,<sup>11</sup> the Home and Community Environment Instrument,<sup>12</sup> Measure of Environmental Quality,<sup>13</sup> the Community Health Environmental Checklist,<sup>14</sup>

the Environmental Quality Assessment Scale, the Facilitators and Barriers to Mobility,<sup>15</sup> and the Young Children's Participation and Environment Measure.<sup>16</sup> Most recently, the Your Ideas about Participation and Environment has been developed to collect information from the perspective of people with disability as to the supportiveness of the environment in achieving participation goals.<sup>17,18</sup>

Beyond the environmental dimension, the ICF also identifies personal factors, such as gender, age, coping styles, social background, education, profession, past and current experience, overall behavior patterns, and personal character as playing a key role in determining an individual's experience of disability. It is recognized that there are hundreds of personal factors that influence the person's experience of disability: some are fixed, some are amenable to change, some are measurable, and many are subjective.<sup>19</sup>

The ICF acknowledges both environmental and personal factors as contextually relevant to functioning. However, researchers suggest that it is the nature of the interaction between each person and their environment, the congruence or discord in that interaction, and not simply the separate personal



and environmental factors, which determines outcomes.<sup>20–22</sup> To add further complexity to this model, person–environment congruence appears to be influenced by the individual's goals within the environment, ie, congruence may vary from one goal to the next.<sup>23</sup> The influence of environmental and personal factors on rehabilitation outcomes is even more evident when rehabilitation is conducted in community settings.<sup>24</sup> Community rehabilitation is substantially influenced by context, and therefore, goal-based community programs require strategies that enhance understanding of the nature and influence of each client's personal and environmental context.<sup>25</sup>

While significant advances have been made in assessing physical and psychological functioning in practice, far less attention has been paid to assess person–environment factors.<sup>22</sup> Recognizing that the extent of person–environment congruence influences goal attainment, these factors should be acknowledged in best practice goal-directed rehabilitation and healthcare services.<sup>23</sup> Tools that reflect the underlying complexity of the person–environment interface, recognize differences in the availability of person–environment facilitators, acknowledge how these facilitators affect outcomes, and accommodate differences in goals and contexts are needed.

**Construction of the person–environment profile.** The person–environment profile (PEP) was developed by the authors to assess an individual's subjective view of the influence of personal and environmental factors on the achievement of an individual's specified rehabilitation goals. While recognizing the influence of environmental factors on participation,<sup>17,18</sup> the PEP explores the client's perspective of both environmental and personal factors, which help or hinder the attainment of a particular goal. The PEP was conceptualized as a clinical assessment tool for goal-based rehabilitation programs, rather than as an outcome measure.

The PEP explores 10 elements: five personal and five environmental. The five personal elements are personality, health and fitness, problem-solving ability, motivation, and attitude. These nondemographic factors are drawn from features of difference between individuals in rehabilitation settings identified in a systematic review.<sup>19</sup> Among the five elements, personality is a collective term for the characteristics, which shape an individual's character. Health and fitness refers to the physical and psychological health and fitness, which may affect an individual's ability to engage with a rehabilitation program and achieve their goals. Problem solving is a broad title adopted by the PEP developers to encompass aspects such as utilizing cognitive skills, ability to learn and adapt, and employing insight. Motivation concerns the energy and drive to commence, and then persists to the conclusion of a task.<sup>26</sup> Attitudes are the way one thinks or feels about something, are generally considered to be formed by the evaluation of previous experience, and are closely related to beliefs and values.<sup>27</sup>

While the five environmental elements in the PEP are derived from the environment chapters of the ICF, they do not encompass the full taxonomy of the ICF. The PEP is

intended to be clinically useful and therefore sufficiently brief for clinicians to use. For a clinical assessment tool to be feasibly used by clinicians in a reasonable time frame, there may be a trade-off against sensitivity and comprehensiveness.

As an initial exploration of concept, four people with long duration spinal cord injury provided feedback about the draft tool. They considered the use of the draft with respect to their personal goals. Feedback was collected through a focus group with clarification via subsequent emails. Six health professionals from a variety of disciplines, working in the area of community rehabilitation (brain injury and spinal cord injury), also assisted the developers by using the draft PEP. They were asked to use it, in relation to their own personal goal, to consider it retrospectively in relation to a goal that had been set by one of their clients, and finally to use it with one or more clients in a rehabilitation context. Feedback was collected from each health practitioner around face validity, clinical potential, and practical utility.

Feedback was generally positive about the ease of use and potential application of the draft PEP. Those who used the draft version found that it made sense, was generally self-explanatory, and was quick (3–15 minutes). A longer time period (30 minutes) was reported when used with some clients with cognitive impairment, but this was reported as being a good time investment due to the benefits arising from the ensuing discussion. Potential uses for the PEP were raised by both consumer and health professional informants. These included building rapport, helping to break down a goal into smaller parts, identifying recurring barriers, revealing personal priorities, identifying issues that a health professional may not have considered, focusing interventions, and ascertaining the likelihood of success. The draft tool was modified based on feedback and was then deemed suitable for pilot testing. The pilot version of the PEP taken to clinical testing is shown in Appendix A.

**Study aims.** Having developed a working version of the PEP, the aim was to pilot it under clinical conditions to establish its utility and to collect data to support a future large-scale psychometric evaluation. The second aim was to encourage dialog about the incorporation of personal and environmental factors into rehabilitation program planning.

## Methods

A protocol for piloting the PEP under clinical conditions was established. This protocol was approved by the Metro South Hospital and Health Service Human Research Ethics Committee.

**Participants.** A transitional rehabilitation service providing community-based programs for people with spinal cord injury agreed to pilot the PEP. This service was selected on the basis of links with the research team and its goal-based model of service delivery. Professionals from physiotherapy, occupational therapy, nursing, and social work were encouraged to use the PEP with their rehabilitation clients. Clients gave their written, informed consent to participate in this research.



All health professionals ( $n = 10$ ) were experienced in the management of spinal cord injury. Clients of the service had sustained traumatic spinal cord injury and were undertaking a transitional program to community living following primary inpatient rehabilitation.

**Tool.** The PEP, comprising five personal elements and five environmental elements, includes verbal descriptors of each question for clarification (see Appendix A). The PEP was designed to be used as an adjunct to goal-setting practice and can be used in conjunction with goal-setting and attainment instruments. The pilot site was already using the Multidisciplinary Goal Attainment Measure<sup>28</sup> to capture goal attainment in this setting. At this point in its early development, it was intended that the PEP be completed with guidance from a clinician and that the process of answering the PEP questions should focus discussion between client and clinician as to the perceived barriers and enablers to goal achievement. Each PEP element is self-rated on a “help—make it harder” continuum in relation to each predetermined goal. One or many goals can be subjected to profiling using the PEP. This provides a visual representation of elements perceived to influence goal achievement positively or negatively.

**Procedure.** Basic orientation was provided to participating health professionals to familiarize them with the PEP and establish a minimally disruptive method of administration. Each health professional was asked to administer the PEP with their clients for one goal. Each client worked with up to four health professionals from different disciplines. For consenting clients, the PEP was administered within their first two weeks of the program. The health professionals were invited to provide written feedback on the experience of using the PEP, and members of the research team (SS or DA) sought further verbal feedback about the experience at the end of the first and third months of the trial during team meetings. This feedback was recorded as field notes. The intention was to pilot the PEP for up to nine months, but this was shortened to three months when implementation issues in the chosen pilot service became apparent.

**Data analysis.** A numerical score from  $-1$  (make it harder) to  $1$  (help) was calculated for each of the 10 PEP elements by measuring the distance from the central point of the scale, which represents 0 (neutral), to the mark placed by the client. This distance was divided by the length of the scale from neutral to the extreme (ie, half the full scale length). Goals were examined and classified into thematic groups. For the 10 PEP elements, the perceived influence of the element on each goal was graphed for all clients participating in the pilot and for each of the goal groups. This allowed visual scrutiny of the data as a mean of establishing response variability. No inferential statistical analysis was conducted due to the relatively small amount of data collected.

Written qualitative feedback from the trial participants and field notes were compiled. The data were grouped into positive and negative comments and then summarized.

## Results

Ten health professionals from the disciplines of nursing ( $n = 2$ ), physiotherapy ( $n = 3$ ), occupational therapy ( $n = 3$ ), and social work ( $n = 2$ ) piloted the PEP with 13 clients. A total of 34 goals were rated. Classification of goals encompassed four broad groups, namely managing impairment (12 goals, eg, managing continence and skin integrity), psychosocial well-being (7 goals, eg, dealing with family stresses and managing emotional well-being), optimizing physical function (6 goals, eg, creating and maintaining a home exercise program, achieving a certain level of community mobility), and daily living tasks (9 goals, eg, performing household tasks and returning to driving).

**Person–environment influences.** Ratings of person–environment influence on goal attainment under the PEP allow participants to identify each element as either helping (positive scores) or hindering (negative scores) and the degree to which that element helps or hinders goal attainment. Figure 1 reflects the reported scores for the influence of the five personal elements on goal attainment. All of these were generally perceived to assist participants in goal attainment, although this varied somewhat.

Some variation can be noted across different goals (eg, managing impairment goals were often ranked differently from psychosocial well-being goals). Some variation can be seen across different elements (eg, some participants noted that personality, level of health and fitness, and level of motivation would hinder certain goals). Similarly, some variation can be seen across different participants (eg, participant 4 noted that all elements assisted in achieving goals, but participant 12 noted little effect of these elements).

Figure 2 reflects that the five environment elements have far greater variability of scores. Some general variability can be noted across different goal domains (eg, most participants recognized a much greater variability of influence of environmental elements on different types of goals). Considerable variability can be seen across different elements (eg, the physical environment was seen to have had a greater effect on goal attainment than did family and friend support). Noteworthy variation can be seen across different participants (eg, participant 13 indicated most environmental elements were helping goal attainment, but participant 3 indicated more environmental elements were a hindrance or neutral).

**Qualitative feedback.** Written staff feedback was provided with the PEP form on 12 occasions. This was balanced between positive and negative experiences. Positive feedback related to clients grasping the concept well and the process being quick, easy, and relevant. Negative feedback noted client’s difficulties understanding the process and the scale, failing to discern between different elements or see the relevance of particular elements and concern about leading the client when providing additional explanation and examples.

The additional time burden of administering the tool within the service model was cited as a problem, more so when

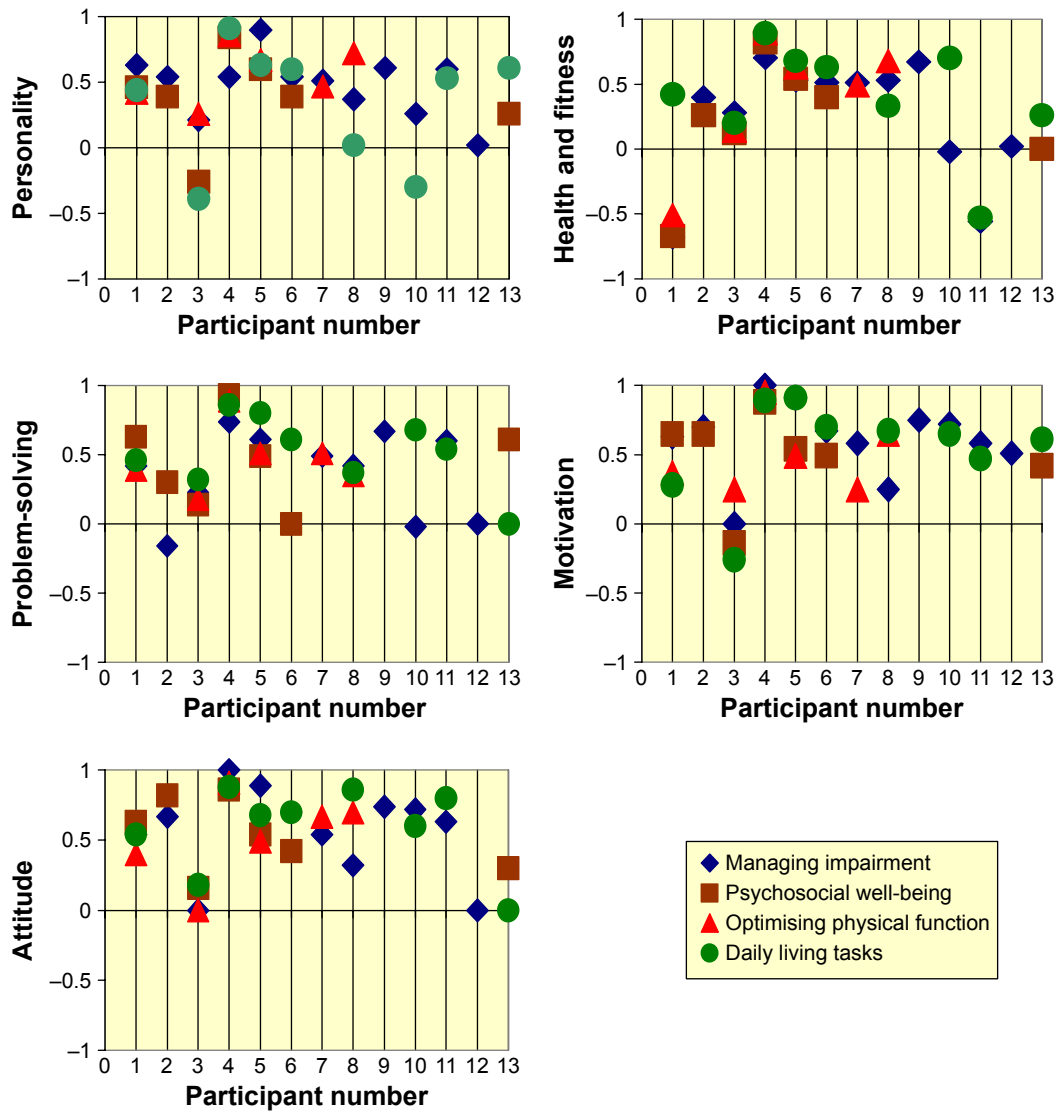


Figure 1. Participant responses across goals for the five personal elements of the PEP.

clients required additional explanation to understand the PEP. This led to an avoidance of trialing it with some clients due to anticipated time investment. Some health professionals noted that they felt uncomfortable administering the PEP and that this interfered with rapport building. For example, from feedback discussions, the concept of personality traits, having influence on a physical goal, was not readily understood by some staff, and some discomfort around discussing this concept with the client was raised. Despite these challenges, health professionals identified conceptual value for the PEP, such as getting to know a client and their perspective and facilitating discussion about a goal. Being mindful of perceptions of time burden, it was decided to suspend data collection in this setting before anticipated.

### Discussion

The PEP is a new instrument under development to assist with understanding the perceived role of personal and environmental

factors in the attainment of rehabilitation goals. The PEP has 10 elements (five environmental and five personal) and was devised with clinical utility in mind. Initial testing of the PEP in a clinical environment has yielded interesting results regarding its ability to detect differences in perceived barriers and facilitators of goal attainment for particular goals for each individual. The testing has also highlighted the challenges of incorporating and evaluating change in assessment practices as a part of day-to-day clinical service provision. We emphasize that these findings are preliminary. Substantial trials with robust statistical analysis are required to understand the full psychometric properties of the PEP and its full value in clinical use.

**Properties of the PEP.** Despite the relatively small amount of data collected during the clinical testing, the results suggest that the PEP may be able to detect differences between participants, between elements, and between goals. Across person–environment influences, the same participant



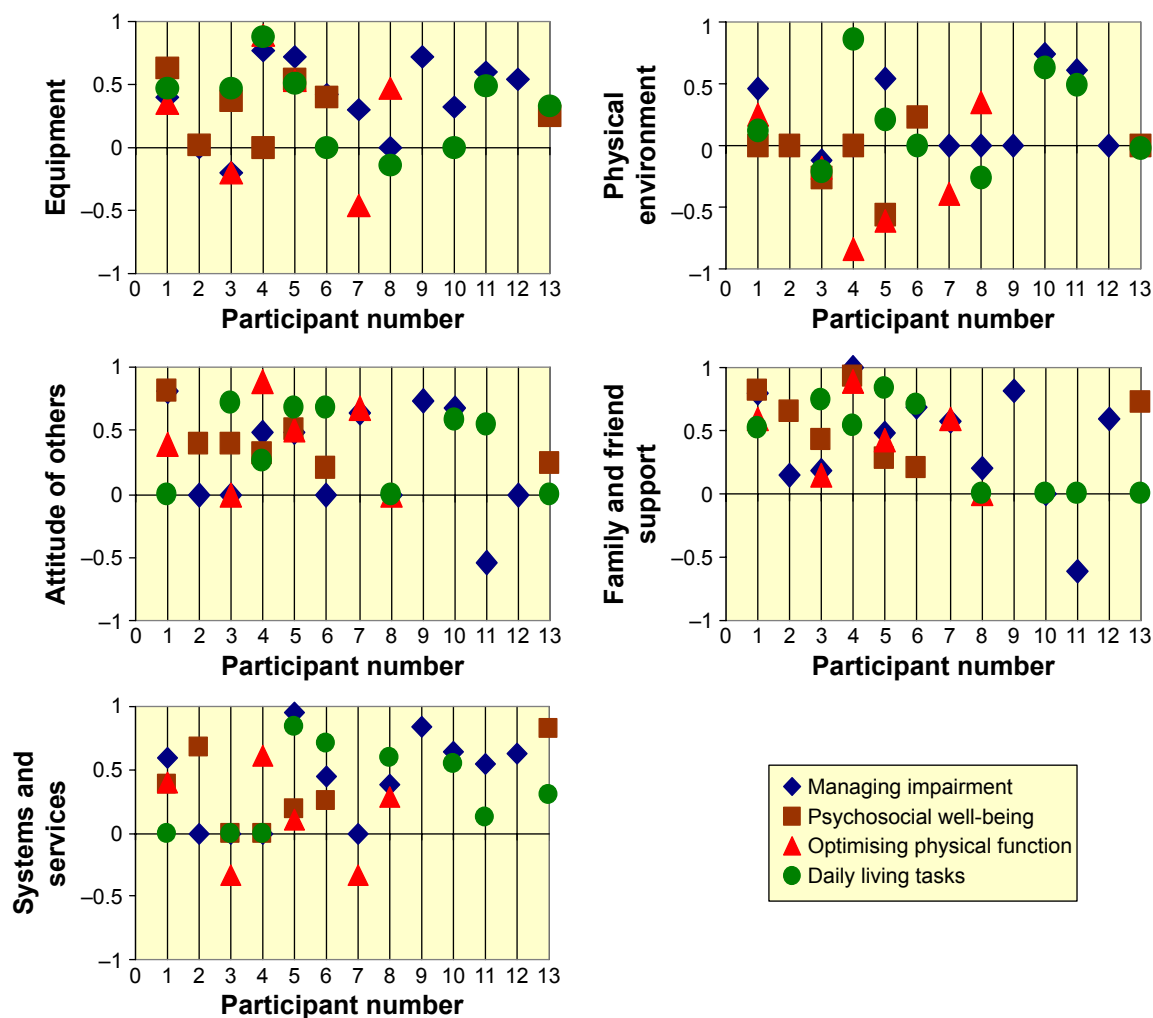


Figure 2. Participant responses across goals for the five environmental elements of the PEP.

often identified elements that would hinder one goal but would help a different goal. This speaks to the sensitivity of the scale to being goal specific, supporting the contention of Struhkamp,<sup>23</sup> who suggested that influences will vary across different goals. Existing person–environment measures that are not goal specific do not have such sensitivity and may not reflect the importance of goal context.<sup>25</sup>

Conversely, the scale was administered for different goals across different goal domains, and for some participants, one or more factors were seen as consistent influences across all goals. A situation like this may highlight major areas to focus intervention for clients and health professionals or alternatively highlight areas where the individual has good resources upon which to draw to support their goal attainment.

Similarly, participants identified distinct differences in influence across PEP elements for a particular goal. This suggests that there is a potential clinical value for such a tool in identifying and addressing person–environment factors to support goal attainment. Furthermore, it supports the subjective means by which the PEP assesses how these various factors interact and influence the individual in their particular circumstances.<sup>29</sup>

One advantage of the PEP lies in its potential ability to detect differences across elements as either facilitators or barriers according to the goal in question (valence). On the whole, many *person elements* seemed to be rated more as a help (eg, personality, health and fitness, problem solving, motivation, and attitude), whereas environmental elements probably had greater identification as a hindrance to goal attainment (eg, equipment and physical environment). Perhaps this reflects that clients feel that they *know* themselves but may be unsure of the environment in which they have to function and the extent to which they can exert influence over its elements. Indeed, previous studies have highlighted that environmental factors are more frequently perceived as barriers,<sup>7,9,10,30</sup> especially those factors such as the physical environment over which the individual feels that they have little control.<sup>29</sup> These environmental barriers are areas where intervention can focus more specifically to assist the individual.<sup>31</sup> The importance of personal factors was definitely highlighted in this research, however, and their role in influencing functioning and goal attainment cannot be underestimated,<sup>4,19,32</sup> even if it is to acknowledge and maximize the way in which these factors can act as facilitators.



PEP elements also varied in magnitude as well as valence, which suggests that the PEP may be able to capture differences in magnitude at an individual level. This is important because sometimes factors that are traditionally perceived as strongly supportive of functioning may not be perceived in this way by all individuals. For instance, the social environment, including family and friend support, has strong evidence as a very influential facilitator of functioning,<sup>12,21,29,33</sup> more so than many other aspects of the environment. It is important that, as health professionals, we elicit the client's thoughts on the degree to which those social environmental factors are supportive. If we fail to do so, we run the risk of making assumptions about the nature of those environmental factors.

**Implementing the PEP in the clinical setting.** It is encouraging to see the PEP tool showing differences across the elements highlighting its potential as a future assessment tool; however, qualitative feedback from the pilot revealed some issues with implementation within the particular service context. Similar to the Your Ideas About Participation and Environment Scale,<sup>17</sup> the PEP was perceived to have its greatest utility as a clinical tool to assist in goal setting, monitoring, and evaluation. The research team had anticipated that a significant benefit of the PEP would lie in the conversation that it facilitated around goals. The rating provided by the client could open a conversation about the reason for their perception of a particular element as helping or hindering and lead on to relevant discussion and planning. This was seen as being of potential value for the client, health practitioner, or both parties. While the PEP was provided as a form to be completed, it was felt that this conversation could also happen without formal use of the form or the visual scale when indicated. Health professionals were encouraged to be flexible in their approach as their judgment dictated.

It would appear that adding an extra clinical task, in a busy service situation, may not have been conducive to enthusiasm and meaningful reflection by staff. The time and workload constraints of health professionals working at the coalface have been widely recognized as a significant barrier to the incorporation of new practices and assessment.<sup>34–36</sup> A more measured approach with greater education and discussion with staff around the concept of person–environment factors and their potential influence on different types of goals prior to the trial may also have been helpful to facilitate confidence and enthusiasm for the trial. Indeed, professional knowledge and comfort in using clinical measures has previously been identified as a significant barrier to routine uptake in the clinical setting.<sup>35</sup> Despite these concerns, the degree of positive feedback for the potential of the PEP suggests that there would be merit in further trialing.

**Challenges and implications for future research.** The pilot period of the PEP was shorter than anticipated, and therefore, data collected were limited. As a result, the research team plans to use the positive indications identified in this

research as feedback for future implementation to continue to refine the PEP in a longer trial. Future trials will include subjecting it to interrater reliability and validity testing. At this point, the PEP has only been piloted in one community rehabilitation program, which limits generalizing across other settings.

Individual participants had different goal domains assessed by different health professionals; therefore, differences in findings may have been related to the practitioner rather than the goal itself. For instance, most *managing impairment* goals were nursing related, most *psychosocial well-being* goals were social work related, most *physical function* goals were physiotherapy related, and most *daily living task* goals were occupational therapy related and administered by those disciplines. The PEP scale relies on an initial goal-setting process, which may differ in nature and emphasis between one health professional and the next. Further research is needed with truly multidisciplinary and client-centered goals that require input from various members of the rehabilitation team.

There may also be benefit in completing the PEP pre- and postrehabilitation to examine anticipated versus actual influences on goal attainment in the rehabilitation setting. For this pilot, it was only completed at the start of the community rehabilitation program. While it is important to be able to identify *potential* threats to successful goal attainment, the key to successful client-centered practice is flexibility and responsiveness in goal setting and intervention. Use of the PEP at multiple points in time may be particularly informative in this process.

Some of the PEP elements may appear similar from a lay person's perspective, for example, *motivation* and *attitude*, as well as *attitudes of others* and *family and friend support*. Consideration needs to be given to whether there was a clear distinction made between these factors or whether the concepts overlapped. Concept mapping on these factors may be a particularly suitable direction for future research.

## Conclusion

The PEP is proposed as a relatively brief, clinical tool for exploring the perceptions of individuals regarding 10 personal and environmental elements, which may influence the setting and attainment of goals during rehabilitation. In preliminary trials, the PEP showed potential to detect differences between a range of personal and environmental elements in their influence as well as highlight the way in which these elements can influence rehabilitation goals differentially. Application of the PEP in clinical practice was limited in the current pilot due to a range of feasibility issues. A future trial by health professionals familiar with person–environment concepts, skilled in facilitation of rehabilitation goals, and with resources and interest to appraise the tool, is needed to ascertain the value of the PEP to clinical practice. The researchers welcome trial of the PEP by others and the provision of feedback and public discourse about the experience.



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## Author Contributions

Conceived and designed the experiments: DIA, MBK, PK, and SBS. Analyzed the data: MBK and SBS. Wrote the first draft of the article: DIA and SBS. Contributed to the writing of the article: DIA, MBK, PK, and SBS. Agreed with study results and conclusions: DIA, MBK, PK, and SBS. Jointly developed the structure and arguments for the article: DIA, MBK, PK, and SBS. Made the critical revisions and approved the final version: DIA, MBK, PK, and SBS. All authors reviewed and approved the final article.

## Supplementary Material

**Appendix A.** The person–environment profile.

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