



Development and Initial Validation of the Pain Progress Measure

Adnan N. Balisi¹ 

TherapyBCD Physical Therapy Clinic, Negros Occidental, Philippines

*Address all correspondence to Adnan N. Balisi at: an.balisi14@gmail.com

To cite this article: Balisi, A.N. (2023). Development and Initial Validation of the Pain Progress Measure. *Philippine Journal of Physical Therapy*. 2(3), 4-17. <https://doi.org/10.46409/002.CJHJ4718>



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Abstract

Introduction. Current numerical rating scales for pain mostly measure symptom intensity. There is a need to develop outcome measures reflecting the multifaceted nature of pain. The purpose of this study is to describe the development and validation of the Pain Progress Measure (PPM), which is an outcome measure intended to capture the holistic nature of pain.

Methods. The author developed 15 pain assessment items related to the biopsychosocial theory of pain. For content validity, 14 expert panelists were purposely selected to assess items as either essential, or useful but not essential, and not essential. The number of essential items was then taken to get the content validity ratio (CVR). Internal consistency reliability was established through Cronbach's alpha.

Results. The mean content validity ratio (CVR= 0.69) was above the critical value of 0.57 and therefore showed that the PPM has good content validity. There were 10 items shown with good CVR, but 5 items did not reach the critical values. Cronbach's alpha shows a coefficient of 0.883, demonstrating good reliability. Pearson-R correlation of 0.94 demonstrates excellent inter-rater reliability.

Discussion. Pain Progress Measure (PPM) items below CVR critical value were removed to create the shortened version of the PPM. The shortened version without items below CVR critical value showed a higher mean CVR. Initial validation and reliability testing of the Pain Progress Measure has shown its capabilities to holistically quantify the pain of patients undergoing physical rehabilitation interventions. However, further research is recommended to expand on other psychometric properties such as concurrent validity, confirmatory factor analysis, and test-retest reliability.

Keywords: pain problem measure, pain assessment, pain measurement, pain scale tool, pain rating scale, psychometric properties of pain measure

Introduction

Accurate pain assessment is crucial to provide effective pain management and improve patient outcomes. The most commonly used outcome measure for pain is the numerical pain rating scale (NPRS). This measure asks for the intensity of patients' pain. The NPRS is easy to administer, convenient, and provides different healthcare workers with a quantified measure of the pain of many patients. However, it does not holistically measure the totality of pain as it is not just a problem of intensity, it is a problem that affects multiple facets of a patient's life (Lazaridou et al., 2018).

The biopsychosocial model of pain states that pain is not just biological in nature but also has psychological and social components (Meints & Edwards, 2018). Pain is a complex concept because of its subjective nature; everyone has different perceptions of the symptoms. Biological aspects include anatomical and physiological effects of pain such as pain intensity, pain duration, muscle weaknesses, limitation of range of motion, and medications taken. Psychosocial aspects of pain include the perception of control of pain, social responses, occupational limitations, and dependency on others (Cho et al., 2021).

The tool was developed out of the need to address the limitations of existing outcome measures for pain in the Philippine context of pain management in private practice physical therapy (PT) settings. The items of the questionnaire and its scaling are based on the observation that most outcome measures have a floor effect because patients seen by private PTs do not present with severe impairments from their disorder. Furthermore, this tool operates to objectively guide a therapist in clinical decision-making.

Understanding the perceptions of control of patients can provide insight into the individual's psychological state and their ability to cope with pain (Balisi and Magallanes, 2023). Individuals who feel in control of their pain are more likely to have a positive outlook on life and better mental health (Smyth et al., 2018). Pain affects mood. Particular items were developed to capture the psychosocial influences of pain, including an individual's perception of their ability to control pain. Individuals who feel that they are in control of their pain are more likely to have better pain management outcomes. They are also more likely to have better mental health outcomes and a better quality of life. Pain perception of control can also help individuals cope with pain more effectively, which can lead to a reduction in pain severity and an improvement in overall well-being. Lastly, pain can also affect a patient's sleep, making them feel tired and less motivated to engage in activities. This should be captured and hence included in this measure. This is a unique item of this tool, which is not seen in other outcome measures. In the social aspect, the PPM has an item that considers the capacity of patients to participate in a social gathering.

There is a need to develop an outcome measure that captures the multifaceted nature of pain. This study addresses this through the development and validation of the Pain Progress Measure (PPM). It is different from other existing pain assessment tools or even pain disability indices as it bridges multiple aspects of pain problems and does not just focus on pain intensity as typical tools do in the Filipino context. Hence, this study aims to describe the development phases of the PPM which are divided into 2 phases – the first phase reports the development of the PPM, and the second phase involves content validation and reliability assessment.

Methods

Phase 1: Tool Development

Rationale for the Creation of the Pain Progress Measure.

Typical pain assessment tools do not consolidate different data into a single score that can be reported to patients. Unlike for example in stroke, there are outcome measures that quantify isolated motor control activities and completion of motor tasks that mimic activities of daily living. Their scores can be reported to patients which track their improvement or progression in rehab. Furthermore, when outcome measures are used, typical tools measure pain intensity and its impact on mood, tendencies for anxiety, sleep, and activity levels (Dydyk and Grandhe, 2023). These pain impact measures do not usually mention the consolidation of scores that allows a clinician to report to patients a single score that indicates their total pain condition. If there is a consolidated score, it is usually the pain intensity that is usually referenced.

The PPM was developed to address the limitations mentioned above. The PPM is intended to quantify various aspects of a pain problem and deliver a single, consolidated score that represents the biopsychosocial condition of the patients. It may allow clinicians to report to patients a number that can consequently track meaningful and measurable progress. The PPM is also an outcome measure that can be utilized in various pain cases regardless of the nature of the case or the area of the pain.

The initial version of the PPM included 15 Likert scale items. The first 3 items include typical items in assessment tools, namely pain intensity, frequency, and duration. Pain intensity refers to the severity of the pain experienced by the patient. Pain frequency refers to how often the patient experiences pain. Subsequently, pain duration is also a vital component of pain assessment as this element is a common complaint of suffering pain patients regardless of the nature of their case. Pain duration refers to how long the patient has been experiencing pain. In the tool, the pain intensity was captured into 5 functional groups denoting decreasing intensities. Pain frequency was divided into every hour of the working day; hence, frequency scoring was developed to start at 8 times, then in reducing categories. Lastly, duration was

developed to start with constant then the other categories are intermittent.

Items 4, 5, 6, and 8 quantify how pain affects activities of daily living (ADLs). Quantifying pain's effect on ADLs is important and it can help pain professionals develop effective treatment plans (van Dalen-Kok et al., 2021). The development of these items includes the practical application of functional muscle performance. The categories in these items emphasize muscle strength, muscle endurance, and muscle power, but are applied to functional situations.

Item 9 is intended to relate the effects of pain on motion. The choices in rating the patient are prepared in a way that uses the American Association of Orthopedic Surgeons as a reference for normative values (Norkin & White, 2017) of Range of Motion (ROM) and also takes into consideration the good side of the patient to apply the concept of symmetry.

Items 7, 10, 11, and 13 quantify the perception of pain control by the individual. These perceptions include the beliefs about their pain, coping strategies, how well they sleep, and understanding of their aggravating and relieving factors. Firstly, patients may have different beliefs about the causes and consequences of their pain, which can influence their willingness to engage in pain management strategies. For instance, some patients may have unrealistic expectations about pain relief and may become frustrated if their pain is not completely eliminated (American Pain Society, 2016). Secondly, coping strategies are the ways in which individuals deal with and manage their pain. By considering the patients' coping strategies, pain therapists can recommend and support the use of effective techniques that align with the patient's preferences and abilities. Furthermore, poor sleep can increase pain sensitivity and make it more difficult for patients to cope with their pain (Haack et al., 2020). By assessing patients' sleep patterns, pain therapists can identify and address any sleep disturbances that may be contributing to the patient's pain experience. Lastly, understanding patients' understanding of aggravating and relieving factors can help healthcare providers develop personalized pain management plans. Patients may have unique triggers that worsen their pain or activities that provide relief. By assessing these factors, healthcare providers can work with patients to identify and avoid aggravating factors and incorporate activities that provide relief into their daily routines. These items can help pain therapists identify personalized approaches that can empower patients to take an active role in managing their pain and improve their overall pain control.

Items 12, 14, and 15 quantify how pain affects independence as it can limit a patient's ability to perform daily activities. Item 12 is about measuring medication; this provides pain therapy providers with objective data about the effectiveness of pain management interventions. Measuring medication is essential in identifying patients who are not responding to pain management interventions and may require alternative treatments (Queremel-Milani and Davis, 2023). In the Filipino context, taking medicine

for pain is not the primary treatment (Galanti, 2000). Hence, taking opioids already means severe pain. This is why it was placed in the highest category, followed by muscle relaxants, and last are anti-inflammatory medicines.

Item 14 addresses social participation. It refers to the extent to which an individual engages in social activities, such as work, leisure, and social interactions. Socially isolated individuals may be experiencing more severe pain than those who are socially active (Yamada et al., 2021).

Understanding a patient's level of independence helps pain management professionals plan interventions that meet the specific needs of their patients (Gauntlett-Gilbert & Brook, 2018). Item 15 allows pain therapists to understand a patient's limitations and abilities. This can develop plans that promote independence while ensuring safety. This also helps identify barriers to independence, such as physical limitations or environmental factors. Furthermore, assessing a patient's level of independence inherently helps monitor the effectiveness of pain management interventions. Pain can significantly impact a person's ability to perform daily activities and maintain independence (Zalah et al., 2023). By assessing a patient's pain levels and their impact on functional abilities, pain management providers can adjust treatment plans accordingly. Increased pain can indicate a patient's willingness for free mobility. Pain can limit a person's range of motion, making it difficult to perform tasks independently (Geneen et al., 2017).

Pain Progress Measure Score Interpretation. The items on the tool are rated on a 6-point scale with 5 being the lowest functionality and 0 as the best score. The Physical Therapist (PT) or healthcare clinician chooses the statement or grading that best describes the condition of the patient through the patient's reports or the clinician's/ PT's observation. Table 1 below summarizes the interpretation of the score from the PPM. Items #1-6, 8-9, and 12 are biological domains of pain while items #7, 10-11, and 13-15 are psychosocial domains of pain. To interpret the PPM score, the clinician solves the mean score of the 15 items and uses the table below to report to the patient and assist in decision-making.

The level 5 pain category is the highest pain level wherein a patient has very severe pain impairment. This may represent the acute worsening or acute presentation of pain. As there is a presence of inflammation, rest for 3 days is recommended and may need physician-prescribed medicines with PT to improve the condition (Horn & Kramer, 2022). The level 4 pain category has serious pain or severe problems. At this level, rest for 1-2 days is recommended as Physical Therapy alone may resolve the problem.

Level 3 is a moderate pain problem while Level 2 has bothering but tolerable pain problems. Low-grade therapeutic exercises are recommended for level 3 as a high level of exercise intensity for moderate pain may disturb the recovery process. Appropriate leveling of exercise intensity is important to recovering body

structures. As pain level decreases, exercise intensity may increase (Lima et al., 2017). Level 1, or mild pain problem, is

recommended to have PT rarely only when there are acute flares. Otherwise, the patient should self-manage (Crawford et al. 2014).

Table 1. Interpretation of PPM Score

Level	General Description	Range	Interpretation
5	Very severe or Extreme impairment or problem	4.21 - 5.00	The patient has an extreme, alarming, or very severe pain problem. Categorize the patient as having an extreme or very severe disability due to pain.
4	Severe impairment or problem	3.41 - 4.20	The patient has a severe and serious pain problem. Categorize the patient as having a disability due to pain.
3	Moderate or fair impairment or problem	2.61 - 3.40	The patient has a moderate or fair pain problem; pain that is annoying and stops a person from doing some work. The patient has no disability due to pain but an inability to perform some level of work.
2	Bothering but tolerable impairment or problem	1.81 - 2.60	The patient has a bothersome, irritating but tolerable pain problem; can continue doing work despite the pain. The patient has no disability due to pain and can continue to work but experiences irritating troubles with pain.
1	Mild or Low impairment or problem	≤ 1.80	The patient has a mild or low pain problem. The patient has no disability due to pain. Patients can work freely but experience mild/low pain problems.
0	No impairment or problem at all	0.00	No pain problem at all.

Readability. The spelling, grammar, punctuation, clarity, and engagement of the pain progress measure were checked through Grammarly, an English language software. As the tool was written in English, it was appropriate for the author to run it through this software. It was rated as above average and had a score well above the typical cut-off rating. The score of this tool reflected that this is easily readable by 80% of English speakers who have finished the 9th grade level.

Phase 2: Assessment of content validity and reliability

Experts for Content Validity Testing. For content validity, 14 expert panelists were purposely chosen and invited to assess the tool. Since this is the Lawshe method, the panelists must be ensured to be experts. Eight of the panelists are physical therapy educators and six of the panelists are clinicians. All the panelists are licensed physical therapists in the Philippines and have training or credited units for competencies in pain therapies. They all have at least 2 years in clinical practice of pain management or musculoskeletal rehabilitation.

Participants for Reliability Testing. There were 2 senior Physical Therapists in the clinic who were chosen purposively for this initial testing as they had the most experience in assessment. Within one month, all of the new 18 pain patients were subjected

to the application of the PPM assessment. These patients either had myofascial pain syndrome or piriformis pain syndrome only. Informed consent was taken from the patients upon assessment, and they were aware that their pain problem was being measured by the PPM. The age range is from 18-64 years old with 13 of them having pain for more than 2 months. None have any psychiatric conditions or any history of misuse of opioid-based pain medications. The internal consistency data was taken from the first assessment or initial evaluation process of all the participants. Since the work of the 2 different PTs is being compared, the measurement was only done at initial evaluation by both of them. Inter-rater reliability was taken by getting the correlation coefficient of the 2 Physical Therapists who each got their scores from the initial 18 patients. Internal Consistency was taken by tabulating the scores and encoding them in a statistical software to solve for the Cronbach's alpha.

Statistical Analysis

Content Validity. The Lawshe Method or Content Validity Index was used to calculate for content validity. The number of essential items was taken to get the content validity ratio (CVR) through a formula as reported by Ayre & Scally (2014). The same authors report that with 14 panelists the critical value for an item to have content validity should be 0.571 as provided by their study.

Inter-rater Reliability. This was taken by getting the correlation coefficient of the 2 Physical Therapists who each got their scores from the initial 18 patients.

Internal Consistency. According to Bruin (2006), reliability can be measured through internal consistency. Internal consistency is taken by tabulating scores from samples per item and each item is correlated to other items. This is the consistency that shows how interrelated items are within the tool. It is a unidimensional form of reliability. Glen (2022) reports that a coefficient of 0.7 for Cronbach's alpha remarks an acceptable internal consistency reliability.

Results

Validity Testing

Table 2 shows that the mean content validity ratio of the PPM is 0.69 which is above the 0.57 cut-off. Items 2, 3, 5, 11, and 13 did not reach the cut-off value. Removing the 5 items that did not reach the cut-off resulted in a mean CVR of 0.87.

Table 2. Content Validity Ratio of PPM Items

Item Number	CVR	Interpretation
1	1.00	Good Validity
2	0.14	Below Critical Values
3	0.43	Below Critical Values
4	0.86	Good Validity
5	0.14	Below Critical Values
6	1.00	Good Validity
7	1.00	Good Validity
8	0.71	Good Validity
9	0.57	Good Validity
10	0.71	Good Validity
11	0.43	Below Critical Values
12	0.86	Good Validity
13	0.14	Below Critical Values
14	1.00	Good Validity
15	1.00	Good Validity
Mean CVR	0.69	Good Validity
Mean CVR (without items below the critical value)	0.87	Good Validity

Legend: CVR – Content Validity Ratio; Critical Value for cut-off = 0.57

Reliability Testing

Table 3 reports that the inter-rater reliability of the PPM is 0.9394, provided by the correlation of the scores each assessed by the 2 different PTs on the same patients. The coefficient is interpreted as excellent.

Table 3. Inter-rater reliability

Pearson-R coefficient	No. of Pairs (n)	p-value	Interpretation
0.939	18	< 0.001	Excellent

Table 4 reports that the internal consistency of the PPM is 0.883. This is interpreted as good reliability which means the items within the pain problem measure are well correlated to each other. The items within the PPM are consistent with pain problems.

Table 4. Internal consistency of PPM

Cronbach's Alpha	N	Interpretation
0.883	18	Good Reliability

Discussion

The mean content validity ratio (CVR= 0.69) shows that the PPM has good validity. However, upon removal of items 2, 3, 5, 11, and 13 which did not reach the critical value, the PPM has a greater mean CVR of 0.87. The result of this validity testing aided the test developer to produce the shortened version for clinical use of the PPM. Thus, a PPM for clinical utilization will be composed of only 10 items which are the ones that hit critical value for validity. This makes the PPM quite shorter and better suited for clinical applications.

Pearson product correlation also reveals an excellent inter-rater reliability among clinicians who assess patients. This means the PTs who will use the PPM are more likely to produce similar results when assessing the same patients. This provides the PPM with the ability to produce consistent and precise results among different users.

Cronbach's alpha shows a coefficient of 0.883 which is interpreted as good reliability. This shows that the items within the PPM are well correlated to each other (Bruin, 2006). Having good internal consistency, different patients with pain would answer similarly because they experience similar events. A remark of good internal consistency demonstrates that the outcome measure can indeed measure the construct of pain problem (Glen, 2022).

Conclusion

The Pain Progress Measure (PPM) has good content validity and good internal consistency reliability for measuring the biopsychosocial aspects of pain patients under physical rehabilitation. It also has excellent inter-rater reliability.

Limitations

This study establishes the basic psychometric properties of the pain progress measure - content validity and internal consistency. It still lacks, however, other critical properties which the author recommends for future studies. This includes predictive validity, concurrent validity, inter-rater reliability, and test-retest validity.

The items within the Pain Progress Measure that correspond to biological aspects or psychosocial aspects are not correlated to other measures such as the Four-item Patient Health Questionnaire, Defense and Veterans Pain Rating Scale, and the General Health Questionnaire. Since this is a pilot study, a small number of patients was utilized for reliability testing.

Directions for Future Studies

Test-retest reliability should be established to confirm the stability of scores for over a week. Inter-rater reliability should also be established. Concurrent and predictive validities should also be established in the next psychometric research for this paper. It is also important that this study establishes baselines in different populations (Morasco & Nicolaidis, 2015). Finally, this author emphasizes performing a confirmatory factor analysis in the next publication.

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Appendix A.1

Original Pain Progress Measure (For Research Purposes)

Instructions: The patient should be under a pain management program by a physical rehabilitation specialist. The **PT** should choose the statement that best describes the condition of the patient by the patient's reports or the PT's observation. The testing is representative of the patient's condition for the past week.

1. Pain Intensity
 - Numerical Pain Rating Scale is 9 - 10.
 - Numerical Pain Rating Scale is 7 - 8.
 - Numerical Pain Rating Scale is 5 - 6.
 - Numerical Pain Rating Scale is 3 - 4.
 - Numerical Pain Rating Scale is 1 - 2.
 - There is no pain at all (0 on Numerical Pain Rating Scale).

2. Frequency of pain
 - Pain comes about more than eight times per day.
 - Pain comes about 7-8 times per day.
 - Pain comes about 5-6 times per day.
 - Pain comes about 3-4 times per day.
 - Pain comes about 1-2 times per day.
 - Pain does not come at all.

3. Duration of pain (regardless of intensity)
 - When the pain comes, it lasts for the whole day; or is constant.
 - When the pain comes, it lasts for an hour or more.
 - When the pain comes, it lasts for 30-59 minutes.
 - When the pain comes, it lasts minutes to half an hour.
 - When the pain comes, it lasts for less than a minute.
 - Pain does not come at all.

4. Intensity, Load, or Weight in/of Activity
 - The patient can NOT carry or lift heavy loads/weights; can NOT perform even low-intensity activities (plank, jump, run, deadlift, push-ups, etc.) at all.
 - The patient CAN only carry or lift below-average loads/weights or perform low-intensity activities (below average or low-intensity means "non-provocative" activities).
 - The patient can only carry or lift submaximal loads/weights or perform moderate-intensity activities (submaximal or moderate-intensity means "provocative" activities but produces little to no pain). The patient that verbalizes "*I do not do heavy activities anyway*" belongs to this category.
 - The patient CAN carry heavy loads/weights or perform high-intensity activities (plank, jump, run, deadlift, push-ups, etc.) but with *severe* (7-8/ 10) pain.
 - The patient CAN carry heavy loads/weights or perform high-intensity activities (plank, jump, run, deadlift, push-ups, etc.) with *minimal to moderate* (1-6 / 10) pain.
 - The patient CAN carry heavy loads/weights or perform high-intensity activities (plank, jump, run, deadlift, push-ups, etc.) without pain.

5. Endurance or repetition of an activity
 - Pain comes in the *first repetition* or comes *within the first minute* of a pain-provoking activity.
 - Pain comes in the *2nd to 10th repetition* or comes *within 30 minutes* (between 1-30 minutes) of a pain-provoking activity; pain comes in the *first set of exercises*.
 - Pain comes between the *11th-20th successive repetitions* or comes in *less than an hour* (between 31-60 minutes) of a pain-provoking activity; pain comes in the *second set of exercises*.
 - Pain comes *after the 20th-30th successive repetition* or comes in *more than an hour* of a pain-provoking activity; *pain comes in the third set of exercises*. The patient that verbalizes "*pain comes unexpectedly sometimes*" belongs to this category.
 - Pain comes *after the third set of exercises*, or pain comes *when tired and fatigued*.
 - The patient CAN perform pain-provoking activity and pain does not come at all.

6. Volume or number of activities (ADLs)
- The patient CANNOT perform any ADLs (household and occupational) at all.
 - The patient CANNOT perform occupational ADLs but can perform *some* household ADLs.
 - The patient CANNOT perform occupational ADLs but can perform *most* household ADLs.
 - The patient CAN perform *some* occupational ADLs and *most* household ADLs.
 - The patient CAN perform occupational and household ADLs but with minimal to moderate pain.
 - The patient CAN perform an unlimited volume of work without pain.
7. Understanding of Aggravating and Relieving Factors
- The patient does not have any awareness about his/her pain; no idea what causes pain and how to self-manage.
 - The patient has a low awareness of what triggers his/her pain and cannot manage it.
 - The patient has some awareness of what triggers his/her pain and cannot manage it.
 - The patient has some awareness of what triggers his/her pain and can manage it slightly.
 - The patient has a good extent of awareness about what triggers and relieves his/her pain; pain is still present somehow but can be prevented.
 - The patient has a high extent of awareness about what triggers and relieves his/her pain; pain doesn't come and can be prevented.
8. Consistency in Usual Routine/ Performing Exercises
- The patient CANNOT perform *most of his/her usual routine* before the pain problem; CANNOT perform exercises as prescribed because of pain.
 - The patient CANNOT perform *some of his/her usual routines* before the pain problem; CANNOT perform exercises as prescribed because of apprehension of pain.
 - The patient CAN perform *most of his/her usual routine* before the pain problem but is *greatly bothered still* by the pain problem. The patient is NOT consistent with exercises and performs only when there is pain.
 - The patient CAN perform *most of his/her usual routine* before the pain problem and is *moderately bothered still* by the pain problem; perform exercises consistently but only every other day (forgets to do).
 - The patient CAN perform *most of his/her usual routine* before the pain problem and is *not so bothered* by the pain problem; consistent with exercises every day as prescribed or performed routinely (to prevent pain); can be with minimal to moderate pain still present.
 - The patient CAN perform *all usual routines* without any pain problem at all; performs exercises consistently without pain.
9. Range of Motion (Relevant ROM)
- The patient feels initial-range pain.
 - The patient is below or above AAOS ROM and asymmetrical.
 - The patient feels mid-range pain.
 - The patient feels end-range pain.
 - The patient has abnormal ROM but is symmetrical.
 - The patient has normal ROM, is symmetrical, and reached AAOS value.
10. Energy, Freshness, Good-feeling, Liveliness, Vigor, Sleep
- The patient has NO energy, walks unrefreshed, has a sense of BAD-feeling, is NOT lively, and perceives weakness or fatigue so he/she stays at home and in bed. The patient *cannot sleep* due to pain.
 - The patient has little energy; has fatigue so he/she stays at home and does some household work. The patient's sleep is highly disturbed (*awakened* multiple or more than 3 times *from sleep*) by the pain and/or finds *great difficulty in sleeping*.
 - The patient has moderate energy; has moderate fatigue so he/she is confused if he/she will go to work or not. The patient's sleep is somewhat disturbed (awakened 1 to 3 times from sleep) by the pain and/or finds *some difficulty in sleeping*. When waking up, the patient seems *tired or not well rested*.
 - The patient has energy but doesn't feel fresh, or good; can be lively but returns to suffering from pain. The patient *finds difficulty sleeping* but can rest, nonetheless.
 - The patient has high energy, walks refreshed, has a sense of good feeling, is lively, and perceives vigor with mild to moderate pain. The patient *can fall asleep relatively fine* and can rest well however *pain may disturb his/her sleep occasionally*.
 - The patient has high energy, walks refreshed, has a sense of good feeling, is lively, and perceives vigor without pain at all. The patient *can fall asleep easily and sleep/rest well also*.

11. Time thinking about the pain.
- Thinks/apprehends/worries about pain all the time.
 - Thinks/apprehends/worries about the pain often.
 - Thinks/apprehends/worries about the pain casually.
 - Thinks/apprehends/worries about the pain sometimes or occasionally.
 - Thinks/apprehends/worries about the pain very infrequently.
 - Doesn't think about the pain at all.
12. Medication Taken
- Takes OPIOID-based medicine partially or as prescribed.
 - Takes Muscle Relaxant medicine partially or as prescribed.
 - Takes analgesic/anti-inflammatory medicine (e.g.: paracetamol or ibuprofen) when pain is intolerable partially or as prescribed.
 - Doesn't take any medicine but the pain still appears, or the patient does not exercise to relieve pain.
 - Doesn't take any medicine but/or the patient exercises to prevent pain or to relieve pain.
 - Doesn't take any medicine because there is no pain.
13. Confidence in control of pain
- The patient feels fully controlled by the pain.
 - The patient feels weak control over pain.
 - The patient feels some control over pain.
 - The patient feels a strong control over pain.
 - The patient feels in full control of the pain.
 - The patient is confident that there is no pain at all.
14. Dependence on others to manage pain.
- The patient needs max assist +2 to transfer and +1 to do hygiene/ self-care.
 - The patient needs max assist +1 to transfer and mod assist to do hygiene/ self-care.
 - The patient needs an orthotic device (modified indep.) to transfer and do hygiene/ self-care.
 - The patient needs supervision, or occasional assistance to transfer and do hygiene/ self-care.
 - The patient is independent but experiences pain.
 - The patient is independent and without pain at all.
15. Social Participation
- The patient cannot participate in any social gathering.
 - The patient can join social gatherings infrequently.
 - The patient can join social gatherings occasionally.
 - The patient can join social gatherings with apprehension.
 - The patient can join social gatherings freely with mild to moderate pain.
 - The patient can join social gatherings freely without pain.

*Please attach this form under the patient's charts.

SCORING SUMMARY:

Item Number	Item Title	Score
1	Pain Intensity	
2	Frequency of pain	
3	Duration of pain	
4	Intensity, Load, or Weight in/of Activity	
5	Endurance or repetition of an activity	
6	Volume or number of activity	
7	Understanding of Aggravating and Relieving Factors	
8	Consistency in performing exercises	
9	Range of Motion (Relevant to the case)	
10	Energy, Freshness, Good-feeling, Liveliness, Vigor, Sleep	
11	Time thinking about the pain	
12	Medication taken	
13	Confidence in control of pain	
14	Dependence on others to manage pain	
15	Social Participation	
<i>PAIN PROBLEM RAW POINTS (75)</i>		
<i>PAIN PROBLEM SCORE ($\div 15$)</i>		

Appendix A.2

Pain Progress Measure (Shortened Version for Clinical Use)

Instructions: The patient should be under a pain management program by a physical rehabilitation specialist. The **PT** should choose the statement that best describes the patient's condition by the patient's reports or the PT's observation. The testing is representative of the patient's condition for the past week.

1. Pain Intensity

- Numerical Pain Rating Scale is 9 - 10.
- Numerical Pain Rating Scale is 7 - 8.
- Numerical Pain Rating Scale is 5 - 6.
- Numerical Pain Rating Scale is 3 - 4.
- Numerical Pain Rating Scale is 1 - 2.
- There is no pain at all (0 on Numerical Pain Rating Scale).

2. Intensity, Load, or Weight in/of Activity

- The patient can NOT carry or lift heavy loads/weights; can NOT perform even low-intensity activities (plank, jump, run, deadlift, push-ups, etc.) at all.
- The patient CAN only carry or lift below-average loads/weights or perform low-intensity activities (below average or low-intensity means "non-provocative" activities).
- The patient can only carry or lift submaximal loads/weights or perform moderate-intensity activities (submaximal or moderate-intensity means "provocative" activities but produces little to no pain). The patient that verbalizes "*I do not do heavy activities anyway*" belongs to this category.
- The patient CAN carry heavy loads/weights or perform high-intensity activities (plank, jump, run, deadlift, push-ups, etc.) but with *severe* (7-8/ 10) pain.
- The patient CAN carry heavy loads/weights or perform high-intensity activities (plank, jump, run, deadlift, push-ups, etc.) with *minimal to moderate* (1-6 / 10) pain.
- The patient CAN carry heavy loads/weights or perform high-intensity activities (plank, jump, run, deadlift, push-ups, etc.) without pain.

3. Volume or number of activities (ADLs)

- The patient CANNOT perform any ADLs (household and occupational) at all.
- The patient CANNOT perform occupational ADLs but can perform *some* household ADLs.
- The patient CANNOT perform occupational ADLs but can perform *most* household ADLs.
- The patient CAN perform *some* occupational ADLs and *most* household ADLs.
- The patient CAN perform occupational and household ADLs but with minimal to moderate pain.
- The patient CAN perform an unlimited volume of work without pain.

4. Understanding of Aggravating and Relieving Factors

- The patient does not have any awareness about his/her pain; no idea what causes pain and how to self-manage.
- The patient has a low awareness of what triggers his/her pain and cannot manage it.
- The patient has some awareness of what triggers his/her pain and cannot manage it.
- The patient has some awareness of what triggers his/her pain and can manage it slightly.
- The patient has a good extent of awareness about what triggers and relieves his/her pain; pain is still present somehow but can be prevented.
- The patient has a high extent of awareness about what triggers and relieves his/her pain; pain doesn't come and can be prevented.

5. Consistency in Usual Routine/ Performing Exercises

- The patient CANNOT perform *most of his/her usual routine* before the pain problem; CANNOT perform exercises as prescribed because of pain.
- The patient CANNOT perform *some of his/her usual routines* before the pain problem; CANNOT perform exercises as prescribed because of apprehension of pain.
- The patient CAN perform *most of his/her usual routine* before the pain problem but is *greatly bothered still* by the pain problem. The patient is NOT consistent with exercises and performs only when there is pain.

___ The patient CAN perform *most of his/her usual routine* before the pain problem and is *moderately bothered still* by the pain problem; perform exercises consistently but only every other day (forgets to do).

___ The patient CAN perform *most of his/her usual routine* before the pain problem and is *not so bothered* by the pain problem; consistent with exercises every day as prescribed or performed routinely (to prevent pain); can be with minimal to moderate pain still present.

___ The patient CAN perform *all usual routines* without any pain problem at all; performs exercises consistently without pain.

6. Range of Motion (Relevant ROM)

___ The patient feels initial-range pain.

___ The patient is below or above AAOS ROM and asymmetrical.

___ The patient feels mid-range pain.

___ The patient feels end-range pain.

___ The patient has abnormal ROM but is symmetrical.

___ The patient has normal ROM, is symmetrical, and reached AAOS value.

7. Energy, Freshness, Good-feeling, Liveliness, Vigor, Sleep

___ The patient has NO energy, walks unrefreshed, has a sense of BAD feeling, is NOT lively, and perceives weakness or fatigue so he/she stays at home and in bed. The patient *cannot sleep* due to pain.

___ The patient has little energy; has fatigue so he/she stays at home and does some household work. The patient's sleep is highly disturbed (*awakened* multiple or more than 3 times *from sleep*) by the pain and/or finds *great difficulty in sleeping*.

___ The patient has moderate energy; has moderate fatigue so he/she is confused if he/she will go to work or not. The patient's sleep is somewhat disturbed (awakened 1 to 3 times from sleep) by the pain and/or finds *some difficulty in sleeping*. When waking up, the patient seems *tired or not well rested*.

___ The patient has energy but doesn't feel fresh, or good; can be lively but returns to suffering from pain. The patient *finds difficulty sleeping* but can rest, nonetheless.

___ The patient has high energy, walks refreshed, has a sense of good feeling, is lively, and perceives vigor with mild to moderate pain. The patient *can fall asleep relatively fine* and can rest well however *pain may disturb his/her sleep occasionally*.

___ The patient has high energy, walks refreshed, has a sense of good feeling, is lively, and perceives vigor without pain at all. The patient *can fall asleep easily and sleep/rest well also*.

8. Medication Taken

___ Takes OPIOID-based medicine partially or as prescribed.

___ Takes Muscle Relaxant medicine partially or as prescribed.

___ Takes analgesic/anti-inflammatory medicine (e.g.: paracetamol or ibuprofen) when pain is intolerable partially or as prescribed.

___ Doesn't take any medicine but the pain still appears, or the patient does not exercise to relieve pain.

___ Doesn't take any medicine but/or the patient exercises to prevent pain or to relieve pain.

___ Doesn't take any medicine because there is no pain.

9. Dependence on others to manage pain.

___ The patient needs max assist +2 to transfer and +1 to do hygiene/ self-care.

___ The patient needs max assist +1 to transfer and mod assist to do hygiene/ self-care.

___ The patient needs an orthotic device (modified indep.) to transfer and do hygiene/ self-care.

___ The patient needs supervision, or occasional assistance to transfer and do hygiene/ self-care.

___ The patient is independent but experiences pain.

___ The patient is independent and without pain at all.

10. Social Participation

___ The patient cannot participate in any social gathering.

___ The patient can join social gatherings infrequently.

___ The patient can join social gatherings occasionally.

___ The patient can join social gatherings with apprehension.

___ The patient can join social gatherings freely with mild to moderate pain.

___ The patient can join social gatherings freely without pain.

*Please attach this form under the patient's charts.

SCORING SUMMARY:

Item Number	Item Title	Score
1	Pain Intensity	
2	Intensity, Load, or Weight in/of Activity	
3	Volume or number of activity	
4	Understanding of Aggravating and Relieving Factors	
5	Consistency in performing exercises	
6	Range of Motion (Relevant to the case)	
7	Energy, Freshness, Good-feeling, Liveliness, Vigor, Sleep	
8	Medication taken	
9	Dependence on others to manage pain	
10	Social Participation	
<i>PAIN PROBLEM RAW POINTS (50)</i>		
<i>PAIN PROBLEM SCORE ($\div 10$)</i>		
<i>Interpretation (Level of Pain Problem)</i>		
<i>True Numerical Pain Score (2x the score)</i>		