Measuring Evidence-Based Practice in Physical Therapy: Translation, Adaptation, Further Development, Validation, and Reliability Test of a Questionnaire

Susanne Bernhardsson, Maria E.H. Larsson

**Background.** Evidence-based practice (EBP) and evidence-based clinical practice guidelines are becoming increasingly important in physical therapy. For the purpose of meeting the goals of designing, implementing, and evaluating strategies to facilitate the development of more EBP in primary care physical therapy, a valid and reliable questionnaire for measuring attitudes, knowledge, behavior, prerequisites, and barriers related to EBP and guidelines is needed.

**Objective.** The 3 objectives of this study were: (1) to translate and cross-culturally adapt a questionnaire to a Swedish primary care context for the purpose of measuring various aspects of EBP and guidelines in physical therapy, (2) to further develop the questionnaire to examine more aspects of guidelines, and (3) to test the validity and reliability of the adapted Swedish questionnaire.

**Design.** This was an instrument development study with validity and reliability testing.

**Methods.** A previously used questionnaire about EBP was translated and cross-culturally adapted to a Swedish primary care physical therapy context. Additional items were constructed. A draft version was pilot tested for content validity (n=10), and a revised version was tested for test-retest reliability (n=42). The percentage of agreement between the 2 tests was analyzed.

**Results.** The development process resulted in a first questionnaire draft containing 48 items. The validation process resulted in a second draft with acceptable content validity and consisting of 38 items. The test-retest analysis showed that the median percentage of agreement was 67% (range=41%-81%). After removal or revision of items with poor agreement, the final questionnaire included 31 items.

**Limitations.** Only face validity and content validity were tested.

**Conclusions.** The final translated and adapted questionnaire was determined to have good face and content validity and acceptable reliability for measuring self-reported attitudes, knowledge, behavior, prerequisites, and barriers related to EBP and guidelines among physical therapists in primary care settings.
Professional behavior in health care settings currently involves applying evidence-based practice (EBP), defined as integrating the best available external research findings with clinical expertise and incorporating patients’ preferences. Physical therapists, like other health care professionals, are expected to use evidence-based treatment methods and keep abreast of current research. However, the amount of physical therapy research has increased dramatically in recent decades, making it difficult for many physical therapists to keep up with research advances and translate findings into practice. Evidence-based clinical practice guidelines have become an important tool for facilitating the uptake of research findings and the development of more EBP in physical therapy, and the number of guidelines also has increased considerably in recent years. Guidelines have been shown to contribute to EBP and improve both quality of care and patient outcomes, yet the extent to which guidelines are used and EBP is applied tends to vary greatly. Measurement of the extent to which health care is evidence based is complex. Social-cognitive theories are increasingly being used to identify variables that underlie the behaviors of health care professionals. Although these theories differ in scope, formulation, and emphasis on particular constructs, together they form an important set of cognitive and motivational variables related to behavior, such as attitudes, beliefs, knowledge, and self-efficacy. Assessment of these variables in relation to EBP and, in particular, to guidelines provides important knowledge about factors that influence the application of EBP and the use of guidelines. This knowledge is important for designing interventions to support the implementation of guidelines with the aim of achieving more EBP in physical therapy. Furthermore, measurement of relevant outcomes is essential for informing organizations and evaluating quality of care. For determining whether an EBP change results in improved practice, it is important to evaluate the change by measuring outcomes before and after its implementation. Moreover, knowledge gained from the measurement can be used in the development and implementation of guidelines.

Evaluating outcomes of EBP should be performed with the same level of rigor as that used for the interventions and procedures that the EBP movement aims to introduce. Measurement of the outcomes of EBP with validated and reliable instruments provides useful information for fostering organizational change and allows comparison among studies. One such instrument is a questionnaire developed by Jette et al. for the assessment of beliefs, attitudes, knowledge, and behavior regarding EBP among physical therapists. This questionnaire has been used for surveying physical therapists in the United States and several other countries. The developers assessed the content validity of the questionnaire; however, the results of this validation were not clearly described. Reliability was found to be rather low for some items; in particular, intraclass correlation coefficients for ordinal items ranged from .37 to .90, with 50% of the items having intraclass correlation coefficients of less than .70.

If a measurement tool such as a questionnaire is to be used in settings and countries other than those for which it was originally developed, meticulous translation and adaptation with rigorous methodology are necessary. The translated version must be validated in the setting for which it was intended, and its reliability must be tested with appropriate statistical methods.

Many new guidelines to assist and support clinical decision making have been developed in recent years, and guidelines are becoming a central component in the process of bridging the gap between research and practice. The questionnaire developed by Jette et al. aimed to describe attitudes, beliefs, knowledge, and behavior related to EBP; guidelines were examined to some extent. In view of the increased prevalence, importance, and role of guidelines in EBP, further knowledge about attitudes toward guidelines and the extent to which guidelines are used is needed.

In Sweden, as in many other countries in Europe, increasing numbers of patients are being treated at primary care facilities, including physical therapy outpatient clinics to which patients have direct access. Physical therapists at primary care physical therapy units in Sweden autonomously provide assessment and treatment, underscoring the importance of achieving EBP. At present, there is limited knowledge about the determinants of EBP in Swedish primary care physical therapy. Assessing these factors can provide knowledge to guide implementation strategies for increasing the use of EBP and guidelines, with the goal of providing effective physical therapy treatments to patients in primary care. A validated and reliable questionnaire about EBP and guidelines is needed to assist health care providers and managers in surveying variables related to EBP as well as in planning and evaluating implementation interventions.

On the basis of these knowledge gaps, the 3 aims of this study were: (1) to translate and cross-culturally adapt a questionnaire to a Swedish primary care context for the purpose...
of measuring various aspects of EBP and guidelines in physical therapy, (2) to further develop the questionnaire to examine more aspects of guidelines, and (3) to test the validity and reliability of the adapted Swedish questionnaire.

**Method**

**Participants**

The questionnaire development process was performed by an expert panel of 4 physical therapists, all with postgraduate education and skills training and with an average of 13 years of clinical experience in primary care physical therapy and specialization in musculoskeletal physical therapy. Two of the panel members also had postgraduate academic training in EBP skills.

Respondents for the validity and reliability tests were recruited from primary care physical therapy units in western and southern Sweden. For the validity test, a sample of 10 primary care physical therapists comprising a strategic mix of sex, age, and other demographic and educational factors was used. For the reliability test, an invitation to participate was sent to a larger sample of 64 primary care physical therapists. Both samples were drawn from counties adjacent to the county in which the survey was to be conducted. Participating physical therapists were identified with the help of an extended network of the developers, such as colleagues of former classmates, and had no personal relationship with the expert panel members.

**Questionnaire Development**

Permission to use and adapt the questionnaire to survey Swedish physical therapists in a primary care context was obtained from its developers. Translation and cross-cultural adaptation were performed in several stages according to established guidelines. The questionnaire was first translated and cross-culturally adapted from English to Swedish independently by 3 physical therapists who were native Swedish speakers and had knowledge of English as their second language. The 3 translations were compared and synthesized into one version. The synthesized translation was then back-translated into English independently by 2 native English speakers—1 physical therapist and 1 person without a medical background. The 2 back-translated English versions were compared and found to differ slightly on 4 items, which were revised for clarity in the synthesized Swedish version. Several items were removed or adapted to better suit the Swedish context. Some modifications due to developments in Internet technology also were considered necessary. For example, questions about Internet access were removed because the use of Internet technology has increased substantially in the 10 years since the questionnaire by Jette et al was developed.

The questionnaire was further developed to explore attitudes toward guidelines in greater depth, and several new items on this topic were constructed. The questionnaire was designed to cover 4 domains of EBP—attitudes (including self-efficacy), knowledge (including awareness of guidelines), behavior (including application of EBP and use of guidelines), and prerequisites and barriers (including availability of and access to guidelines and other resources)—slightly modified from the original questionnaire. The items were organized in 4 sections: demographic/workplace data, EBP, guidelines, and availability of and access to resources. Most items were addressed with a 5-point Likert scale with the response categories “strongly disagree,” “disagree,” “neutral,” “agree,” and “strongly agree.” To increase the sensitivity of the scale, 2 key questions concerning the perceived importance of guidelines were assessed with 11-point numeric scales anchored by “not important at all” and “very important.” Items related to frequency were assessed with the response categories “very seldom or never,” “seldom,” “sometimes,” “quite often,” and “very often.” Items related to access to information were assessed with a 3-point scale and “yes/partially/no” response options. New items addressing reasons why guidelines would be important were constructed. An item about the use of guidelines was revised to examine the frequency of use. An open-ended item was constructed to identify diagnoses for which there was a need for guidelines. A multiple-choice item was constructed to assess barriers to using guidelines.

**Validity Test**

Content validity was established in consensus discussions by the expert panel members. The first draft of the questionnaire was analyzed to determine whether it covered all aspects of the content or domains intended to be measured and contained no irrelevant items. For further evaluation of content validity as well as evaluation of face validity, the first draft of the questionnaire was distributed for pilot testing. The 10 pilot testers were asked to complete the questionnaire and to comment on readability, comprehensiveness, and perceived relevance of the items; completion time; and whether they were reluctant to answer any of the questions. The pilot testers’ comments were reviewed by the expert panel members, who reached consensus concerning rephrasing, changing of the order of items, clarifications, and a reduction in the number of items. Responses from the pilot testing were also analyzed with regard to missing responses and distribution.
pattern. The questionnaire was converted to a web-based format.

Reliability Test
For assessment of test-retest reliability, the validated, web-based, second draft of the questionnaire was distributed by e-mail to a sample of 64 primary care physical therapists. The questionnaire was administered on 2 occasions, separated by a 1- to 2-week interval. Test-retest reliability was analyzed for the individual items in the questionnaire. Demographic and workplace data were not included in the analysis. After the data analysis, all items with poor reliability were either removed or revised in further consensus discussions by the expert panel members for additional clarity and specificity.

Data Analysis
Data from the validity test were analyzed with respect to response distribution. Data quality was assessed with an analysis for missing data. Test-retest reliability for ordinal data was analyzed in terms of the percentage of agreement (PA) between the 2 test occasions with the Svensson method.22,23 The Svensson method is a nonparametric statistical method specifically developed to determine levels of agreement in rank-invariant paired ordinal data. Paired ranks (dependent data) allow the user to distinguish between individual or occasional and group or systematic changes between the 2 tests.

Systematic and individual disagreements were calculated. These calculations included systematic relative disagreement in position (RP), which indicated whether there was a systematic change in position on the scales between the 2 tests, and systematic relative disagreement in concentration (RC), which indicated whether there was a systematic change in concentration (the extent to which answers were centered in the middle of the scale) on the scales between the 2 tests. Values for RP and RC can range from −1 to 1, with a value close to 0 representing a small systematic disagreement (ie, a high level of reliability) of the analyzed item. The so-called relative rank variance (RV), indicating individual occasional disagreement between the tests, also was calculated. Values for RV can range from 0 to 1, with a low RV value representing a small individual disagreement (ie, a high level of reliability). Ninety-five percent confidence intervals were used. These were considered significant when they did not include the value 0, indicating statistically significant changes between the 2 tests.22,23

Second, systematic disagreement was further analyzed visually for all items by plotting the cumulative proportions for the marginal distributions against each other in a so-called Q-Q curve.22 Different shapes of the curve indicate whether the systematic disagreement is one of RP or RC. An S-shaped curve is an indication of systematic disagreement in RC (Fig. 1).

Finally, statistically significant changes between the 2 tests were determined by calculating 95% confidence intervals for the RV, RP, and RC values. Items with poor agreement, defined as a PA of less than 60%, were either discarded from the questionnaire or revised.
The calculations for the Svensson test were performed with a Microsoft Excel (Microsoft Corp, Redmond, Washington) macro constructed by the developer. Descriptive statistics were performed with IBM SPSS 19.0 (IBM Corporation, Armonk, New York).

Ethical Considerations
Ethical approval was not necessary for this study, as communicated in an advisory statement received from the Regional Ethical Review Board of Gothenburg. Respondents were informed about the purposes of the study and of the questionnaire. All questionnaires were filled out anonymously, and the responses could not be tracked back to the respondents. The web-based questionnaire administered in the test-retest analysis contained a sentence informing respondents that they accepted participation in the study by filling out the form.

Role of the Funding Source
This study was part of a guideline development project for physical therapy in primary care, Region Västra Götaland, and no external financing was received.

Results
The development process and the results of the validity and reliability tests are shown in Figure 2. The forward-backward translation process and the addition of new items resulted in a first draft of the questionnaire comprising 48 items in 4 sections. In the validity test, all 10 pilot testers (8 women and 2 men; median age = 35 years) reported that the questionnaire addressed aspects of EBP relevant to their practice. Time to answer varied from 10 to 15 minutes. Examination of the responses from the pilot testers revealed no missing data and revealed a skew distribution, that is, a ceiling effect, of responses to several items. No floor effect was identified. Ambiguities in wording were identified for 22 items, 16 of which were rephrased. The remaining 6 unclear items and 4 other items were considered redundant or irrelevant and were removed. The total number of items was reduced from 48 to 38, and the number of sections was reduced from 4 to 3 (the section on availability of and access to resources was removed, and the remaining items were moved to other sections). After revision, the second draft of the questionnaire was determined by the expert panel members to have acceptable face and content validity.

For the test-retest analysis, 42 respondents completed the test on 2 occasions, and their responses were included in the analysis. Respondent characteristics are shown in Table 2. The number of items included in the analysis was 28. The frequency of item-level missing responses ranged from 0% to 4.9%. The PA for the individual items ranged from 41% to 81%, with a median value of 67%. Seven items had a PA of less than 60%. The 2 items measured with only 3-point scales had PAs of 67% and 71%, respectively, whereas the PAs for the 2 items measured with 11-point scales were 56% and 57%, respectively.

Of the 28 items visually analyzed, marginal distributions indicated systematic disagreements for 17 items (Tab. 3). For 4 of those items, all measuring attitudes, the systematic disagreement in RP was significant, indicating a change in the positions of the responses on the scales toward lower values. There was no significant systematic disagreement in RC. There was significant occasional disagreement in RV for 3 items, implying random individual changes in the responses. The 2 items measured with 11-point category scales had extreme confidence intervals of −1 to 1, providing further proof of the poor reliability of these items.

Fourteen items were found to have a ceiling effect; 3 of those were among the 11 items with satisfactory agreement. In total, 7 items were removed, and 13 were revised. For the 2 items measured with 11-point scales, the scales were reconstructed to 5-point scales. The final questionnaire contained 31 items, 8 of which were questions about demographic, educational, and work characteristics. The remaining 23 items represented 4 domains—attitudes toward EBP and guidelines (12 items), knowledge about EBP resources and guidelines (4 items), behavior related to EBP and guidelines (5 items), and prerequisites and barriers related to EBP and guidelines (4 items) (Appendix).

Discussion
The results of the present study indicate that, in general, the translation, cross-cultural adaptation, and further development of the questionnaire were successful. The questionnaire was found to be valid in terms of face and content validity for the measurement of EBP aspects in Swedish primary care physical therapy. The test-retest results obtained in the present study, with PA values for the final questionnaire ranging from 60% to 81%, are in line with those for the original questionnaire, with PA values ranging from 59% to 93%; however, reliability was found to be lower for some of the ordinal items.

Another instrument, the Fresno test, was recently adapted to assess physical therapists’ EBP skills. However, this instrument is intended for health care educators’ assessment of EBP knowledge and skills and does not measure other variables, such as attitudes or behavior, or any aspects of guidelines, precluding any meaningful comparisons. Several other
Instruments for measuring EBP knowledge and skills have been developed. However, none of them focuses on physical therapy, and most of them are targeted toward students and were developed to evaluate the teaching of EBP rather than the application of EBP in clinical practice. We have found no other questionnaire measuring EBP in physical therapist practice against which we can compare our findings.

For content validation, we used both a sample of primary care physical therapists and the expert panel, also comprising primary care physical therapists, to assess the comprehensiveness of the questionnaire and the

Figure 2.
Flowchart of the development process and the results of the validity and reliability tests. PA=percentage of agreement, Sig.=significant, Syst.=systematic.
relevance of the items. Therefore, it should be possible to draw inferences with regard to the target population and context. The iterative process with which the questionnaire was reviewed and consensus was reached by the expert panel on several occasions strengthens the validity conclusions.

In the reliability test, visual analysis of marginal distributions indicated systematic disagreement for slightly more than half of the analyzed items (17/28). However, the Svensson test revealed that this systematic disagreement in RP was significant only for 4 items, all measuring attitudes. The highest level of disagreement was found for the 2 items measured with 11-point response scales, which subsequently were reconstructed to 5-point scales. The values for significant disagreement were all negative, indicating a change in attitudes toward lower categories on the second test occasion. Still, with the exception of the findings for the 2 items measured with 11-point scales, all 95% confidence intervals were rather narrow, indicating that the disagreements were not substantial. The significant occasional disagreement (RV) found for 3 items implies that there was individual variation between the 2 test occasions for these items and suggests interpretation difficulties with these items. They were also among the items with the lowest PA and, hence, among the items that were revised.

The Svensson test, a rank-invariant method, was considered to be the most appropriate method for our analysis because it takes into account the fact that the data are paired and assessed on ordinal rating scales. Another possible method—more commonly used for ordinal data—is the weighted kappa method.21 However, the weighted kappa method cannot separate systematic disagreements in categorization from random individual disagreements, as the Svensson method does. This property is important in the development of an instrument, to ensure the stability of the instrument. Unlike the kappa method, the Svensson method is valid regardless of the number of categories.22

Constructing response categories is one of the challenges in questionnaire development. It is difficult to construct Likert scales that are consistent, meaningful, and evenly spaced.28 We considered different scales for some of the items. In our draft questionnaire, the key items about the importance of guidelines were addressed with questions and 11-point numeric scales ranging from “not at all important” to “very important.” The 11-point scales were constructed in an attempt to enhance sensitivity to change. However, the test-retest analysis revealed poor agreement for those items, causing us to reconstruct both the items and the response scales. We converted the questions to statements and used verbal 5-point scales, in line with the format for the other items, for the final questionnaire. This alteration was deemed to be a sacrifice of sensitivity to change for the benefit of a higher level of reliability. Scales with more response categories are generally believed to be more sensitive, but such is not necessarily the case; in fact, more response categories can decrease the stability of a questionnaire.29

**Limitations**

The methods used to validate our questionnaire were limited to content and face validity evaluations. For example, construct validity was not assessed with factor analysis because the instrument was intended to measure item by item and not in factors. Testing of criterion validity was considered to be difficult because no other instrument measuring self-reported attitudes and behavior

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. (%) men/women</td>
<td>5 (12)/37 (88)</td>
</tr>
<tr>
<td>No. (%) of respondents in the following age groups:</td>
<td></td>
</tr>
<tr>
<td>20–29 y</td>
<td>3 (7)</td>
</tr>
<tr>
<td>30–39 y</td>
<td>15 (36)</td>
</tr>
<tr>
<td>40–49 y</td>
<td>10 (24)</td>
</tr>
<tr>
<td>50–59 y</td>
<td>10 (24)</td>
</tr>
<tr>
<td>60+ y</td>
<td>4 (9)</td>
</tr>
<tr>
<td>No. (%) of respondents with the following years of experience in primary care physical therapy:</td>
<td></td>
</tr>
<tr>
<td>0–5</td>
<td>10 (24)</td>
</tr>
<tr>
<td>6–10</td>
<td>11 (26)</td>
</tr>
<tr>
<td>11–15</td>
<td>5 (12)</td>
</tr>
<tr>
<td>16–20</td>
<td>3 (7)</td>
</tr>
<tr>
<td>&gt;20</td>
<td>13 (31)</td>
</tr>
<tr>
<td>No. (%) of respondents with the following education:</td>
<td></td>
</tr>
<tr>
<td>3-y bachelor’s degree</td>
<td>27 (64)</td>
</tr>
<tr>
<td>Lower-level degree</td>
<td>9 (21)</td>
</tr>
<tr>
<td>Master’s or higher degree</td>
<td>6 (14)</td>
</tr>
</tbody>
</table>
EBP Questionnaire

Table 3. Percentages of Agreement, Occasional Disagreement, and Systematic Disagreement in Items Measured With Ordinal Data (n=42)

<table>
<thead>
<tr>
<th>Item</th>
<th>Percentage of Agreement</th>
<th>Occasional Disagreement Relative Rank Variance (95% CI)</th>
<th>Systematic Disagreement Relative Position (95% CI)</th>
<th>Relative Concentration (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature and research findings are useful</td>
<td>64</td>
<td>0.07 (0.00, 0.16)</td>
<td>−0.13 (−0.3, 0.05)</td>
<td>−0.03 (−0.08, 0.03)</td>
</tr>
<tr>
<td>Need to increase the use of evidence</td>
<td>59</td>
<td>0.12 (0.00, 0.27)</td>
<td>0.14 (−0.03, 0.30)</td>
<td>−0.15 (−0.31, 0.01)</td>
</tr>
<tr>
<td>EBP places unreasonable demands on physical therapists</td>
<td>50</td>
<td>0.25 (0.03, 0.47)</td>
<td>0.07 (−0.12, 0.25)</td>
<td>−0.07 (−0.27, 0.12)</td>
</tr>
<tr>
<td>Strong evidence is lacking for most of the interventions</td>
<td>63</td>
<td>0.02 (0.00, 0.05)</td>
<td>−0.13 (−0.23, −0.02)</td>
<td>0.03 (−0.12, 0.18)</td>
</tr>
<tr>
<td>EBP helps me make decisions about patient care</td>
<td>80</td>
<td>0.01 (0.00, 0.02)</td>
<td>−0.06 (−0.17, 0.06)</td>
<td>0.07 (−0.02, 0.17)</td>
</tr>
<tr>
<td>EBP does not take into account patient preferences</td>
<td>55</td>
<td>0.22 (0.04, 0.40)</td>
<td>0.04 (−0.12, 0.21)</td>
<td>0.09 (−0.09, 0.27)</td>
</tr>
<tr>
<td>Know how to access relevant databases via e-library</td>
<td>43</td>
<td>0.10 (0.00, 0.19)</td>
<td>0.02 (−0.12, 0.15)</td>
<td>−0.08 (−0.28, 0.13)</td>
</tr>
<tr>
<td>My facility encourages the use of current research in practice</td>
<td>62</td>
<td>0.04 (0.00, 0.11)</td>
<td>−0.12 (−0.25, 0.00)</td>
<td>−0.12 (−0.29, 0.04)</td>
</tr>
<tr>
<td>Have received training in literature search</td>
<td>71</td>
<td>0.04 (0.00, 0.11)</td>
<td>0.10 (−0.01, 0.22)</td>
<td>−0.04 (−0.17, 0.09)</td>
</tr>
<tr>
<td>Confident in my ability to find relevant research</td>
<td>67</td>
<td>0.14 (0.00, 0.32)</td>
<td>0.07 (−0.09, 0.22)</td>
<td>−0.09 (−0.24, 0.07)</td>
</tr>
<tr>
<td>How important is it that guidelines exist?</td>
<td>57</td>
<td>0.04 (0.00, 0.08)</td>
<td>−0.26 (−0.34, −0.18)</td>
<td>−8.6 (−1.00, 1.00)</td>
</tr>
<tr>
<td>How important is it to use guidelines?</td>
<td>56</td>
<td>0.11 (0.00, 0.23)</td>
<td>−0.29 (−0.37, −0.21)</td>
<td>−10.61 (−1.00, 1.00)</td>
</tr>
<tr>
<td>Know how and where to access guidelines</td>
<td>67</td>
<td>0.04 (0.00, 0.16)</td>
<td>0.09 (−0.07, 0.26)</td>
<td>−0.03 (−0.16, 0.11)</td>
</tr>
<tr>
<td>Use guidelines in my practice</td>
<td>69</td>
<td>0.11 (0.00, 0.28)</td>
<td>0.10 (−0.05, 0.25)</td>
<td>0.12 (0.01, 0.23)</td>
</tr>
<tr>
<td>Guidelines are important to facilitate my work</td>
<td>76</td>
<td>0.01 (0.00, 0.03)</td>
<td>−0.10 (−0.24, 0.03)</td>
<td>0.06 (−0.03, 0.14)</td>
</tr>
<tr>
<td>Guidelines are important to provide equal treatment</td>
<td>76</td>
<td>0.00 (0.00, 0.01)</td>
<td>−0.11 (−0.20, −0.02)</td>
<td>−0.05 (−0.20, 0.09)</td>
</tr>
<tr>
<td>Difficult to integrate guidelines with individually tailored treatment</td>
<td>41</td>
<td>0.13 (0.01, 0.25)</td>
<td>−0.02 (−0.19, 0.15)</td>
<td>0.05 (−0.16, 0.26)</td>
</tr>
</tbody>
</table>

*Percentages of agreement of less than 60% indicate poor agreement. Low relative rank variance values and relative position and relative concentration values close to 0 represent a high level of reliability. Values in bold indicate significant changes. CI=confidence interval, EBP=evidence-based practice.*

Related to EBP in primary care physical therapy could be found, and measuring self-reported behavior (e.g., using guidelines and reading literature) against actual or observed behavior was not deemed possible in the present study.

With self-report questionnaires it is difficult to know whether respondents are expressing what they really believe and do or what they think they are expected to believe and do. This social desirability bias is a known problem with self-report scales and is likely to be even more prevalent when professional attitudes and behavior are being measured. The frequent ceiling effect for many of the items in our draft questionnaire, indicating positive attitudes toward EBP and guidelines, may have been partially attributable to social desirability bias. If answers are affected by social desirability, the validity of an instrument can be jeopardized. Another likely reason for the ceiling effect was the limited number of response categories (5), which might not have been sufficient to capture variations among respondents. The ceiling effect influences both content validity and reliability. It also influences the sensitivity and responsiveness of a questionnaire, that is, its ability to
detect differences among groups or subgroups of respondents and its ability to detect changes in dependent variables, respectively. For our questionnaire, it was difficult to determine whether the ceiling effect was a consequence of the instrument or whether it simply reflected generally positive (self-reported) attitudes.

A further reliability issue concerns the implicit assumption that professional attitudes, knowledge, and behavior are relatively stable, at least in the absence of interventions. Such stability is probably rarely the case. The possibility that some of the disagreement between the 2 test occasions reflected an actual change in attitudes, knowledge, or behavior, rather than a flaw of the instrument, cannot be ruled out. Attitudes can change even in as short a time interval as 1 to 2 weeks (eg, after a discussion with colleagues during a coffee break). Even the act of completing the questionnaire the first time may have caused a change in attitudes.

The sample used in the test-retest analysis was a convenience sample of primary care physical therapists whose primary experience was in the treatment of musculoskeletal disorders. Therefore, our findings should be interpreted with caution and cannot be generalized to physical therapists who work in other areas or settings.

A potential limitation related to the composition of the expert panel is that its members all worked in primary care settings and had experience primarily in the treatment of musculoskeletal disorders. However, this factor may also be considered an advantage because the majority of patients who are treated in primary care physical therapy settings have musculoskeletal disorders.

A drawback of the questionnaire is the large number of items, which required a completion time of 10 to 15 minutes and is likely to affect return rates. However, the instrument is intended to measure many aspects of dependent variables, meaning that the use of fewer items likely will decrease content validity.21 Also, the large number of items provides for more possible outcome levels and, hence, the possibility for the questionnaire to detect change. Another limitation of the present study is that the reliability of the revised version of the questionnaire was not tested again.

These limitations notwithstanding, the questionnaire had good content and face validity and acceptable test-retest reliability and can be used to measure important aspects of EBP and guidelines in primary care physical therapy. The additional items about guidelines make the adapted questionnaire more comprehensive. The questionnaire can be used to survey physical therapists, and the measurement of EBP and guidelines can provide knowledge about factors important for the application of EBP and the use of guidelines. The questionnaire also can be used to identify barriers to EBP, to guide the development and implementation of guidelines, and to evaluate the effects of EBP education and implementation efforts.

Further studies on the psychometric properties of the instrument are warranted. Considerations for future studies and recommendations for other instrument developers include exploring the use of 5-point response scales, including more respondents to allow for the testing of construct validity, and assessing test-retest reliability with the easily applied and mathematically correct Svensson method.

Conclusions
The final translated and adapted questionnaire contained 31 items and measured 4 domains of EBP: attitudes, knowledge, behavior, and prerequisites and barriers. It was determined to have good face and content validity and acceptable test-retest reliability. The results suggested that this questionnaire can be a useful instrument for measuring self-reported attitudes, knowledge, behavior, prerequisites, and barriers related to EBP and guidelines in a Swedish primary care physical therapy setting.

Both authors provided concept/idea/research design, data analysis, and writing. Ms Bernhardsson provided data collection.

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Appendix.

Questionnaire on the Use of and Attitudes Toward Evidence-Based Practice (EBP) and Guidelines in Physical Therapy

Evidence-based practice is defined as integrating the best available external clinical evidence from systematic research with individual clinical experience and patient preferences.1

A. The first part of the questionnaire is about personal/demographic information.

1. Are you male or female?
   □ Male   □ Female

2. To which age group do you belong?
   □ 20–29 years   □ 30–39 years   □ 40–49 years   □ 50–59 years   □ 60+ years

3. For how many years have you worked as a physical therapist in primary care?
   □ <3 years   □ 3–5 years   □ 6–10 years   □ 11–15 years   □ 16–20 years   □ >20 years

4. What is your highest degree in physical therapy?
   □ <2.5 years of education
   □ 2.5 years of education
   □ 3 years of education/bachelor’s degree
   □ Master’s degree (1 year)
   □ Master’s degree (2 years)
   □ PhD student
   □ Doctoral degree

5. Do you have a specialist certificate from LSR (Swedish National Association of Physiotherapists)?
   □ Yes   □ No

5a. If yes, in which area? ____________________________

6. In which primary care area do you work?
   □ Göteborg
   □ Södra Bohuslän
   □ Fyrboadal
   □ Södra Älvsborg
   □ Skaraborg

7. How many physical therapists work at your main place of work?
   □ <3   □ 3–5   □ 6–10   □ 11–15   □ >15

8. What portion of your total work time do you spend with patient care (including patient administration)?
   □ <25%   □ 26–50%   □ 51–75%   □ >75%

(Continued)
B. The following part is about attitudes toward, use of, and perceived benefits and limitations of EBP.

Evidence-based practice is defined as integrating the best available external clinical evidence from systematic research with individual clinical experience and patient preferences.1

Answer the questions by checking the response alternative you consider the most suitable.

9. I consider it necessary to apply EBP in the daily practice of physical therapy.
   □ Strongly disagree  □ Disagree  □ Neutral  □ Agree  □ Strongly agree

10. I think it creates unreasonable demands to apply EBP in my daily work.
    □ Strongly disagree  □ Disagree  □ Neutral  □ Agree  □ Strongly agree

11. I want to learn and improve the knowledge and skills necessary to apply EBP in my work.
    □ Strongly disagree  □ Disagree  □ Neutral  □ Agree  □ Strongly agree

12. Strong evidence is lacking for most treatments that I use for my patients.
    □ Strongly disagree  □ Disagree  □ Neutral  □ Agree  □ Strongly agree

13. EBP can help me make decisions in the choice of treatment.
    □ Strongly disagree  □ Disagree  □ Neutral  □ Agree  □ Strongly agree

14. Number of scientific articles related to my clinical work that I read, during a typical month.
    □ ≤1 article  □ 2–5 articles  □ 6–10 articles  □ 11–15 articles  □ 16+ articles

15. Number of times I use PubMed or other databases to search literature that is relevant to my clinical work, during a typical month.
    □ ≤1 time  □ 2–5 times  □ 6–10 times  □ 11–15 times  □ 16+ times

16. I know how to access relevant databases via Region Västra Götaland’s e-library.
    □ Strongly disagree  □ Disagree  □ Neutral  □ Agree  □ Strongly agree

17. At my place of work the use of current research is encouraged.
    □ Strongly disagree  □ Disagree  □ Neutral  □ Agree  □ Strongly agree

18. I feel confident in my ability to find relevant research to answer my clinical questions.
    □ Strongly disagree  □ Disagree  □ Neutral  □ Agree  □ Strongly agree

19. I feel confident in my ability to treat my patients according to current evidence.
    □ Strongly disagree  □ Disagree  □ Neutral  □ Agree  □ Strongly agree

C. The following part is about attitudes toward and use of clinical practice guidelines.

Guidelines are “systematically developed recommendations with the purpose to facilitate for caregivers and patients to make decisions about suitable treatment in specific situations.”2 In this survey, “guidelines” means “evidence-based clinical practice guidelines for physical therapy.”

20. I consider it important that easily available evidence-based guidelines related to my work exist.
    □ Strongly disagree  □ Disagree  □ Neutral  □ Agree  □ Strongly agree

(Continued)
Appendix.
Continued

21. I consider it important to use evidence-based guidelines in my work.
   □ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

22. I’m aware that evidence-based guidelines for diagnoses relevant to my work exist.
   □ Yes □ Partially □ No

23. I know how and where to find evidence-based guidelines related to my work on the Internet.
   □ Yes □ Partially □ No

24. I have fast and easy access to relevant evidence-based guidelines at my place of work.
   □ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

25. I use evidence-based guidelines in my work.
   □ Very seldom or never □ Seldom □ Sometimes □ Quite often □ Very often

26. I can integrate the patients’ preferences with evidence-based guidelines.
   □ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

27. Evidence-based guidelines are important to facilitate my work.
   □ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

28. Evidence-based guidelines are important so that the patients receive the best possible treatment.
   □ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

29. Evidence-based guidelines are important so that patients receive equal treatment.
   □ Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

30. For which diagnoses would you benefit the most from having evidence-based guidelines? State up to 5 diagnoses.

31. Mark the factors below that constitute the greatest barriers to using evidence-based guidelines. You can mark as many as you wish.
   □ Lack of time
   □ None or too few guidelines exist for my patient groups
   □ Don’t know where to find guidelines
   □ Takes too long to read guidelines
   □ Guidelines are too general and too unspecific
   □ Guidelines are too much “recipe” and don’t let me decide what is most appropriate
   □ Lack of support from my colleagues at my place of work
   □ Lack of interest
   □ Other

31a. If you answered “Other,” please state what.
Do you have any other comments on EBP, guidelines, and treatment methods?
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________

Your answers are anonymous, and no answers can be tracked to a particular person. By answering the survey, you accept that your answers are analyzed by computer and can be used in research.

References

* Permission to use and adapt the questionnaire to survey Swedish physical therapists in a primary care context was obtained from its developers.