Instruments to Assess Evidence-Based Practice Among Health Care Professionals: A Systematic Review

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Abstract

Background. The use of measurement instruments to assess the use of Evidence-Based Practice by health professionals has been frequently reported in studies. Aims. This systematic review aimed to summarize, describe, and evaluate the measurement properties of the instruments that evaluate the use of Evidence-Based Practice in health professionals. Methods. The search was carried out in four databases considering three groups of search terms: evidence-based practice, evaluation, and measurement proprieties. Studies were included that described the use of instruments to assess Evidence-Based Practice in health professionals, with the full-text publication, which analyzed the measurement properties, in English. The methodological quality of the studies was evaluated using COnsensus-based Standards for the selection of health Measurement INstruments. Results. In total, 6,429 were found and only 92 were eligible for data analysis. Forty new instruments were identified most were developed for nursing and physical therapist. The investigators performed at least 1 type of validity test on 73% of the instruments. Reliability was tested at 90%, through internal consistency. Responsiveness was tested on less than half of the instruments (30%). Most of the instruments identified are reliable and valid to measure evidence-based practice in health professionals. Conclusion. Although the Fresno Test remains the most complete instrument, and adequate for use. The COnsensus-based Standards for the selection of health Measurement INstruments checklist classified 7 (seven) instruments as suitable for the target audience.

Keywords

health education, healthcare, measurement, formative evaluation

Introduction

Evidence-based practice (EBP) has been considered an essential competence to guide decisions in clinical practice (Bostrom et al., 2018; Fernandez-Dominguez et al., 2017; Leung et al., 2014; McEvoy et al., 2018). This movement is increasingly consolidated among health professionals who believe in the value of research evidence to guide their clinical decisions (Lewis et al., 2011; Lizarondo et al., 2014). EBP can be defined as the conscious and judicious use of the best evidence science to guide decisions about health care (Cook, 1998; Herbert et al., 2011; Jennings & Loan, 2001; Marita, 2006; Sackett et al., 2000). To this end, it incorporates knowledge related to high-quality clinical research, professional knowledge, and patient preferences (Herbert et al., 2005; Ilic, 2009; Lewis et al., 2011; Shiwa et al., 2011). However, the EBP is essential for patients, professionals, and health services as it provides safe and effective interventions, better diagnosis and prognosis of the patient, and reduces health costs (Shiwa et al., 2011).

Several strategies have been described to assess the use of this practice, among which is the use of measurement instruments (Coppenrath et al., 2017). Among the hundreds of instruments available the majority are self-explanatory questionnaires based on clinical scenarios (Buchanan et al., 2016; Cardoso et al., 2017; Leung et al., 2014; Shaneyfelt et al., 2006). A systematic review published in 2006 identified more...
than a hundred instruments that assess the use of EBP in health professionals (Shaneyfelt et al., 2006). The study pointed out that most instruments were administered to medical professionals and students (Leung et al., 2014; Shaneyfelt et al., 2006). Among EBP skills, the acquisition and evaluation of scientific evidence were the most commonly evaluated. The test of at least one type of validity was demonstrated in 53% of the instruments. However, only 10% of EBP instruments established three or more measurement validity types. In addition, instruments to assess behaviors individually to determine the effectiveness of EBP curricula (Shaneyfelt et al., 2006) were used.

Still, seven of the 104 instruments identified in this review by Shaneyfelt et al. (2006) were classified as LEVEL 1 instruments, as they presented properties of reliable measures for interrater reliability and internal consistency, in addition to three or more types of validity tested (Lewis et al., 2011). Among these seven instruments identified, only the Berlin Questionnaire and Fresno Test assess all stages of EBP comprehensively (Shaneyfelt et al., 2006). Both were developed to evaluate the teaching of EBP with students and medical professionals (Bennett et al., 1987; Fritsche et al., 2002; Ramos et al., 2003). However, the Fresno Test is the only instrument that, in addition to assessing all stages of the EBP adoption process, presents an assessment through more realistic clinical scenarios, enabling the assessment of applied competencies and skills (Illic, 2009; Silva & Padula, 2021).

Shaneyfelt et al. (2006) is the most recent systematic review on the subject, the criteria adopted for analyzing the properties of the instruments did not follow methodological guidelines for developing a review. In the study, no procedures were described for the analysis of the methodological quality of the included studies as well as for the evaluation of the properties of measures extracted from each instrument. In addition, the use of a checklist to classify each measured property evaluated was not reported.

Given the relevance of the subject in the last decade and the time that has elapsed since the Shaneyfelt et al. review, an updated systematic review is necessary, as other instruments with acceptable methodological quality may have emerged. Therefore, it is required to update the systematic review of the instruments for assessing the use of EBP to complement these aspects and update existing instruments. The study aimed to summarize, describe, and evaluate the measurement properties of the instruments that evaluate the use of EBP in health professionals.

Method

Protocol and Registration

This is a systematic review of instruments for assessing the use of EBP, verification, and analysis of measurement properties tests. This review was conducted and reported according to recommendations from the Preferred Reporting Items for Systematic Reviews and Meta-Analyzes (PRISMA) checklist (Page et al., 2021). It was registered under CRD-42018103212 in PROSPERO (International prospective register of systematic reviews) and can be accessed at https://www.crd.york.ac.uk/prospero/#recordDetails.

Impact Statement

This systematic review identified and selected the most appropriate instruments to assess health professionals’ use of evidence-based practice, supported by good measurement properties.

However, gaps in knowledge about the available instruments were still identified. The instruments showed moderate/low overall quality of evidence and need to be more responsive tests. It also highlights the need for instruments suitable for use by certain health professionals.

The study contributes to the development and consolidation of the use of evidence-based practice among health professionals and to the design of new studies on instruments for evaluating the use of EBP in the target audience.

Search Strategy

A systematic search was conducted in the following databases: PubMed, Excerpta Medica database (EMBASE), Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Educational Resources Information Center (ERIC).

Three search term groups were used: EBP: evidence-based medicine; critical appraisal; clinical epidemiology; clinical question; medical informatics; attitude to health; health education; competency-based education; students, public health; perception. Evaluation: program evaluation; program assessment; questionnaire; scale; index; instrument; evaluate; measurement; test. Measurement properties: cross-cultural comparison; validation studies; psychometrics; reproducibility of results; statistics; observer variation; methods; comparative study; outcome assessment; discriminant analysis; translation; validation; agreement; clinimetric; construct validity; concordance; internal consistency; interpretability; measurement properties; reproducibility; responsive; reliability; measure; sensitive; responsiveness.

As search strategies, the following steps were adopted: Within each group, there was a combination of terms with the OR particle. Subsequently, the groups were combined with the AND particle (Supplementary Appendix 1). In addition, manual searches, specific search by authors, contact with researchers, and internet sites were performed. Studies that describe instruments for assessing the use of EBP in students and health professionals were identified. These studies were analyzed for their methodological quality and their
of measures that contain one or more aspects were defined as the scope of the EBP domains covered and the properties of measures tested.

The studies selected were the ones that: (a) presented an evaluation instrument; (b) evaluated EBP in health professionals in general; (c) presented the publication of a full-text scientific article; (d) tested the measurement properties; and (e) publication of an article in English. Studies that (a) were published in another language were excluded; (b) evaluated teaching, but not an evidence-based practice.

Searches were limited by publication date and included studies from 2006 to July 2020. The searches were performed again before the final analysis on July 30, 2020, and other studies could be retrieved for inclusion. The results of the search strategies were imported into the ENDNOTE® X9 software, and the duplicates were removed. The deadline for the publication of a study with exclusion criteria was May 2006.

**Criteria for Eligibility of Studies**

The inclusion criteria for searches for EBP instruments were (a) to quote in their title or their summary of the descriptors; (b) that the instrument or strategy for the use of EBP has assessed the patient’s skills, attitudes, behaviors, or results; (c) or that the instrument should present results of measurement properties tests.

To standardize the concepts and terminologies used in this study, the BOX of definitions of variables and terminology described by Shaneyfelt et al., (2006) was considered. The domains for EBP were defined as knowledge, skill, attitude, behavior, and viability. The skill domain considered the participants’ ability to ask, acquire, evaluate, and apply the evidence in clinical decision-making. The behavior domain considered the participants’ performance for performing EBP steps in practice, execution of evidence-based clinical maneuvers, and achieving favorable results with the patient.

**Evaluation of the Methodological Quality of Eligible Studies**

The data regarding the measurement properties were extracted from each study and analyzed according to the CONSensus-based Standards for the selection of Health Measurement Instruments (COSMIN) initiative (Mokkink et al., 2010, 2016; Terwee et al., 2012). The systematic assessment of the methodological quality of each instrument considered three quality domains: reproducibility; validity and responsiveness. Each domain contains one or more measurement properties. The reproducibility domain considered three measurement properties: internal consistency, reliability, and measurement error. The validity domain also considered three measurement properties: Content validity, construct validity, and criterion validity. The responsiveness domain considered only one measurement property, called responsiveness. The properties of measures that contain one or more aspects were defined separately: Content validity included face validity and construct validity included structural validity, hypothesis testing, and cross-cultural validity (Garcia et al., 2017; Menezes Costa et al., 2009; Mokkink et al., 2006, 2016; Terwee et al., 2007).

To classify each measurement property, the COSMIN guidelines were used for systematic reviews of Patient Reported Outcome Measures (PROMs) initiative (Mokkink et al., 2010, 2016; Terwee et al., 2007, 2012). The guideline consists of 10 boxes recommended for obtaining global scores for the methodological quality of studies in systematic reviews. The score for each item in a box was obtained considering a four-point rating scale (V = very good; A = adequate; D = doubtful; I = inadequate; Mokkink et al., 2010, 2016; Terwee et al., 2007, 2012)

Each classified study took into account the worst score for a given box. Thus, a box that classified some items as excellent but presented an item as poor was classified as of low methodological quality (Mokkink et al., 2010, 2016; Terwee et al., 2007, 2012).

**Data Extraction and Analysis**

From the selected articles, data regarding the tested psychometric properties were extracted. A COSMIN Risk of Bias Checklist was used for systematic reviews of PROMs (Mokkink et al., 2010). The checklist consists of nine boxes, including Box A (development); Box B (content validity, including face validity); Box C (structural validity); Box D (internal consistency); Box E (cross-cultural validity); Box F (reliability); Box G (measurement error); Box H (criterion validity); Box I (construct validity—hypothesis tests); and Box J (responsiveness; Mokkink et al., 2010, 2016; Terwee et al., 2007, 2012).

Other aspects of the instruments identified were also extracted, such as the sample size, the target audience, the year of publication, and the instrument’s application method as well as the steps and domains for adopting the EBP proposed by the instrument. The process of evaluating the methodological quality of the studies was carried out by two independent evaluators (MAS and DPV). An independent reviewer (RSP) resolved possible disagreements during the process.

**Results**

In total, 6,429 studies were found in four databases searched, among which 92 (Appendix 2) were considered eligible for data analysis. Of the 92 included studies, 46 different EBP assessment instruments were identified. The PRISMA flow-chart of the study is shown in Figure 1.

**Description of the Studies**

Nursing professionals were the most evaluated samples (59.8%), followed by Physiotherapists (27.1%), and Physicians (19.6%). Most of the instruments used were aimed at assessing graduated professionals (71.8%). The United States and...

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Australia were the countries that presented the largest number of publications (48.9%). Most publications occurred in the last 4 years (50.0%) and with a sample (N) between 101 and 500 participants (43.5%). The name of the instrument used in the three studies was not reported, despite the description of the characteristics of the instruments. Eleven studies reported the use of more than one instrument to assess EBP (Table 1).

**Description of EBP Assessment Tools**

As for the characteristics of the EBP assessment instruments identified, the Fresno Test (FRESNO) was the most used (12.0%), followed by the Evidence-Based Practice Attitude Scale (EBPAS; 10.9%), and Nurse Manager EBP Competency Scale (8.7%; Table 2). Among the 46 instruments identified, the majority (78.2%) consisted of closed questions and a Likert-type scale of answers administered to the participants in printed form (44.5%). Most of the studies had cross-sectional designs (75.0%), and the objective was to develop new instruments and reduced versions (34.8%) and to conduct a formative assessment (individual; 83.7%). The EBP Domain most evaluated was attitude (63.0%), followed by knowledge (55.4%), and skills (28.2%).

The researchers performed at least 1 type of validity test on 73% of the instruments evaluated in the study (Table 3). Reproducibility was tested on 90% of the instruments using internal consistency. Responsiveness was tested on less than half of the instruments (30%). According to the COSMIN checklist, the classification for evaluating each tested measurement property considered the evaluation sufficient (+). Internal consistency was the reproducibility test that presented the highest percentage of sufficient evaluation (+), with 76%. Construct validity was assessed as sufficient (+) in 67% of the instruments. There was no risk of bias for the quality in more than half (54%) of the studies. The studies that presented a “high” quality rate of evidence represented 50% of the total evaluated studies.

**Categorization of Study Quality**

As in the study by Shaneyfelt et al. (2006), we defined the 7 (seven) instruments that were classified as LEVEL 1 (Table 4). These instruments were considered suitable for use in the target audience. However, we consider the COSMIN initiative to define the quality of the instruments. The instruments were classified as LEVEL 1, based on the following criteria: (a) no risk of bias for the methodological quality of the studies; (b) high-quality evidence; (c) tests of reliability, validity, and responsiveness classified as sufficient; and (d) scope in the domains and stages of adoption of EBP, proposed by the instrument. The criteria were adopted considering the general classification for all studies described on the instrument.

The EBPQ and QUICK-EBP-VIK instruments tested all the measurement properties that make up the COSMIN checklist evaluation BOX. These instruments assessed...
internal consistency, reliability, structural validity, cross-cultural validity, construct validity, and responsiveness. However, both only evaluate three of the four domains proposed for the adoption of EBP. The validation studies report the limitations of these instruments concerning the response format (self-report) and sample size used. The EBPQ consists of 24 items and 3 subscales and has a short version of 19 items. The QUICK-EBP-VIK consists of 25 items and 3 subscales, has a short version of 19 items, and measures three domains of EBP: value (V), implementation (I), and knowledge (K).

Among the seven instruments classified as NIVEL 1, HS-EBP has the highest number of assessment items (questions), followed by EBPPAS. The HS-EBP consists of 76 items and 5 subscales and features a version of 60 items and evaluates knowledge, skills, attitudes, and behavior related to EBP in health professionals. It presents the evaluation by

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**Table 1. Characteristics of the Included Studies (N = 92).**

| Characteristics                          | N (%) |
|-----------------------------------------|-------|
| Included studies                        | 92 (100) |
| Localized instruments                   | 46 (100) |
| Participants’ profession<sup>a</sup>    |       |
| Nurse                                   | 55 (59.8) |
| Physiotherapist                         | 25 (27.1) |
| Physician                               | 18 (19.6) |
| Occupational Therapist                  | 13 (14.1) |
| Psychologists                           | 6 (6.5) |
| Speech therapists                        | 4 (4.3) |
| Others                                  | 13 (14.1) |
| Level of training<sup>a</sup>           |       |
| Professionals                           | 79 (71.8) |
| Students/Residents                      | 31 (28.2) |
| Country of origin of samples            |       |
| United States                           | 30 (32.6) |
| Australia                               | 15 (16.3) |
| Spain                                   | 8 (8.7) |
| Canada                                  | 7 (7.6) |
| Norway                                  | 3 (3.3) |
| Sweden                                  | 3 (3.3) |
| Others                                  | 26 (28.2) |
| Total countries                         | 24 (100) |
| Year of publication                     |       |
| From 2006 to 2010                       | 14 (15.2) |
| From 2011 to 2014                       | 32 (34.8) |
| From 2015 to 2018                       | 46 (50.0) |
| Sample of studies (N)                   |       |
| ≤100                                    | 25 (27.2) |
| 101–500                                 | 40 (43.5) |
| 201–1,000                               | 15 (16.3) |
| 1001–2,000                              | 9 (9.8) |
| >2,000                                  | 2 (2.1) |
| Não informado                           | 1 (1.1) |

<sup>a</sup>The categories are not exclusive for each study.

**Table 2. Characteristics of the EBP Assessment Instruments (N = 92).**

| Characteristics                          | N (%) |
|-----------------------------------------|-------|
| Included studies                        | 92 (100) |
| Localized instruments                   | 46 (100) |
| Used instruments<sup>a</sup>            |       |
| FRESNO                                  | 11 (12.0) |
| EBPPAS                                  | 10 (10.9) |
| EBPB                                    | 8 (8.7) |
| EBP                                     | 7 (7.6) |
| EBP2                                    | 7 (7.6) |
| SET-EBP                                 | 5 (5.3) |
| The response categories                 |       |
| Likert Scale                            | 72 (78.2) |
| Open questions                          | 20 (21.8) |
| Study design                            |       |
| Cross-Sectional                         | 69 (75.0) |
| Development of instruments              | 23 (25.0) |
| Measurement properties evaluation       | 10 (10.9) |
| Adaptation                              | 7 (7.6) |
| Cross-cultural adaptation               | 20 (21.7) |
| Longitudinal studies                    | 23 (25.0) |
| Instrument development                  | 9 (9.8) |
| Training evaluation                     | 8 (8.7) |
| Measurement properties evaluation       | 6 (6.5) |
| Evaluation                              |       |
| Formative or summative (individual)     | 77 (83.7) |
| Effectiveness of educational interventions (cluster) | 15 (16.3) |
| Administration of instruments           |       |
| Questionnaire                           | 41 (44.5) |
| Web (online)                            | 25 (27.2) |
| Printed and web                         | 8 (8.7) |
| Not informed in the study               | 18 (19.5) |
| Evaluation domains of EBP<sup>b</sup>   |       |
| Knowledge about EBP                     | 51 (55.4) |
| Skills to EBP                           | 26 (28.2) |
| Ask                                     | 43 (46.8) |
| Acquire                                 | 42 (45.6) |
| Evaluate                                | 69 (75.0) |
| Apply                                   | 68 (74.0) |
| Attitudes to EBP                        | 58 (63.0) |
| Behavior to EBP                         | 14 (15.2) |
| EBP steps taken<sup>c</sup>             |       |
| 1 step                                  | 19 (20.7) |
| 2 steps                                 | 36 (39.1) |
| 3 steps                                 | 6 (6.5) |
| 4 steps                                 | 5 (5.5) |
| 5 steps                                 | 34 (37.0) |

Note. The Nurse Manager EBP Competency Scale; EBP2 = Evidence-Based Practice Profile; EBPPAS = Evidence-Based Practice Attitude Scale; EBPB = Evidence-Based Practice Beliefs; FRESNO = Fresno test; SE-EBP = Self-Efficacy of Evidence-Based Practice.

<sup>a</sup>The categories are not exclusive for each study. <sup>b</sup>The definition of EBP domains is based on the BOX of definitions of variables and terminology described by Shaneyfelt et al. (2006).<sup>17</sup> <sup>c</sup>Studies that used more than one instrument in the development of the study were considered.
question using four-point Likert-type scales and includes open fields for suggestions. EBPPAS was developed to assess the impact of EBP education on students and health professionals. It consists of 37 items and 4 subscales based on the five stages of the EBP adoption process. As for the limitations, the high number of items in these instruments may be related to the low response rate reported in the validation studies.

EPIC is a self-report scale developed to assess the effects of EBP education among health professionals. It consists of 11 items that describe the steps considered relevant to the EBP adoption process. These steps include acquiring, evaluating, and effectively applying the identified evidence to solve a clinical problem. Participants are assessed for their confidence in executing each step. The instrument has limitations regarding the sample profile used. The EPIC-KABQ consists of 33 items and 4 subscales and features a version of 27 items that measure and evaluate knowledge, skills, attitudes, and behavior related to EBP in health professionals. However, limitations are reported in both studies related to geographic and demographic differences in the samples. In addition, the instrument is presented in English only.

FRESNO was the most used instrument by researchers. It was also the instrument that evaluated the use of EBP in the largest number of different professions among health professionals. Eleven studies evaluated EBP in Physicians; Nurses; Speech therapists; Occupational Therapists; Physiotherapists; and Nutritionists. The instrument assesses all the domains proposed for the adoption of EBP. The Fresno Test is a self-explanatory instrument where the participant must choose one of the clinical scenarios so that one can answer the open questions from it. It stands out for presenting the most realistic clinical scenarios, enabling the assessment of applied knowledge and skills.

Discussion

Summary of Evidence

This study was to carry out an update through a systematic review of the instruments for assessing the use of EBP and the quality of the measurement properties of the instruments. We evidenced that in recent years, health students have been poorly evaluated for using EBP. The study by Shaneyfelt et al. (2006) is the most recent systematic review on the subject. Our study showed a considerable increase in new instruments aimed at non-medical professionals compared with the study by Shaneyfelt et al. (2006). A total of 46 instruments were identified, 40 new ones regarding the study by Shaneyfelt et al. (2006). Of these new ones, most were developed for nursing professionals and physiotherapists. Studies with other health professionals where physicians were not included in the samples may have contributed to the emergence of new instruments. These health professionals were included in more than 80% of the studies. This means an increase of 67% compared with the 2006 study (Shaneyfelt et al., 2006).

The emergence of new instruments makes it possible to assess the EBP adoption process’s effectiveness constantly. This is an important indicator of the development and consolidation of the use of EBP among health professionals. However, even with the emergence of new studies and instruments, there still needs to be professionals included in this process of evaluating the use of EBP. Only two instruments were identified to assess the use of EBP with dental professionals. One of them did not present a denomination. The other is called Evidence-Based Practice Knowledge, Attitudes, Access, and Confidence Evaluation. Both were classified as “low-quality of evidence” by the COSMIN checklist. The Modified Fresno Test assessed the use of EBP by Nutritionists, the only instrument adapted for these professionals, and presented “high-quality evidence.” Still, no instruments were identified to assess the use of EBP in Pharmacy and Biomedicine professionals.

The fact that almost half of the studies (48.9%) have American and Australian English as their native language is also a problem. Because although certain professions have several instruments available, few have been adapted for specific languages and countries. Thus, although health professionals increasingly believe in the value of research evidence to guide their decisions, there is a need to develop or adapt to new instruments with suitable measurement properties for use in these populations.

Only 28% of the studies included students in the samples. These findings can hinder the development and consolidation of this practice among health professionals. The teaching of EBP and the constant assessment of competencies and skills acquired by professionals during their training can alleviate the difficulty in seeking, interpreting, and translating the evidence into clinical practice. It is the biggest obstacle faced by health professionals in adopting EBP. The attitude toward...
| Instrument | Author (year) | EBP domains | Sample (N) | Characteristics of the instrument | Risk of bias | Measurement properties* | Classification—COSMIN checklist | Quality of evidence |
|------------|---------------|-------------|------------|-----------------------------------|-------------|--------------------------|---------------------------------|---------------------|
| EBP-KABQ   | Vanitha Arumugam et al. (2018) | 1-Knowledge 2-Skills 3 -Attitudes 4-Behavior | N = 675 N = 673 | 4 subscales - 33 and 27 items Physicians; Nurses; Psychologists; Occupational Therapists and Physiotherapists | No | Internal consistency Reproducibility Content validity Construct validity Responsiveness Responsiveness | Sufficient (+) High |
| EBPPAS     | | 1-Knowledge 2—Attitudes 3-Behavior | N =100 N =220 | Self-Report 4 subscales - 37 items Nurses; Psychologists and e Occupational Therapists | No | Internal consistency Reproducibility Content validity Construct validity | Sufficient (+) High |
| EBPQ       | Flórez-López et al. (2013) Sesé-Abad et al. (2014) Son et al. (2014) | 1-Knowledge 2-Skills 3—Behavior | N = 1,064 N = 1,673 N = 801 | Self-Report 3 subscales - 24 and 19 items Nurses and Physiotherapists | No | Internal consistency Reproducibility Content validity Transcultural Validity Construct validity Responsiveness Responsiveness | Sufficient (+) High |
| EPIC       | Salbach etc al. (2011, 2013) | 1-Behavior | N =10 | Self-Report 11 items Physicians; Nurses; Speech therapists; Occupational Therapists and Physiotherapists | No | Internal consistency Reproducibility Content validity Responsiveness | Sufficient (+) High |
| FRESNO     | Dory et al. (2010) Laibhen-Parkes et al. (2018) Argimon-Pallás et al. (2010) Halm (2018) Silva et al. (2016) Argimon-Pallás et al. (2010) Lizarondo et al. (2014) Buchanan et al. (2015) Lizarondo et al. (2013) Tilson et al. (2016) | 1-Knowledge 2-Skills 3—Attitudes 4-Behavior | N =275 N =42 N =90 N =275 N =29 N =114 N =57 N =157 N =22 N =84 N =55 N =16 | Self-Report 16, 13, 12, 11 and 7 items Physicians; Nurses; Speech Therapists; Occupational Therapists and Nutritionists. | No | Internal consistency Reproducibility Transcultural Validity Construct validity Responsiveness | Sufficient (+) High |
| HS-EBP     | Fernández-Dominguez et al. (2016) Fernández-Dominguez et al. (2016) | 1-Knowledge 2-Skills 3—Attitudes 4-Behavior | N =32 N =211 | Self-Report 5 subscales - 76 and 60 items Physicians; Nurses; Physiotherapists, e Psychologists | No | Internal consistency Reproducibility Content validity Responsiveness | Sufficient (+) High |
| QUICK-EBP-VIK | Connor et al. (2017) Zhou et al. (2019) | 1-Knowledge 2—Skills 3-Behavior | N =382 N =402 | Self-Report 3 subscales - 25 and 19 items Nurses | No | Internal consistency Reproducibility Content validity Transcultural Validity Construct validity Responsiveness | Sufficient (+) High |

Note. EBP = Evidence-Based Practice; COSMIN = COnsensus-based Standards for the selection of health Measurement; EBP-KABQ = Evidence—Based Practice—knowledge, attitude, behavior questionnaire; EBPPAS = Evidence-Based Practice Process Assessment Scale; EBPQ = Evidence-Based Nursing Questionnaire; EPIC = Evidence-based practice confidence; FRESNO = Fresno Test; HS-EBP = Health Sciences–Evidence-Based Practice; QUICK-EBP-VIK = Value, Implementation, and Knowledge of Evidence-Based Practice.

*aEvaluation values of the measurement properties according to the COSMIN checklist.
EBP characterizes a skill that can also alleviate these difficulties. Among studies, attitude was the most evaluated EBP use domain (63%). The COSMIN checklist considered the construct validity of more than half of the instruments (67%) appropriate (sufficient).

These values are higher than Shaneyfelt’s study in 2006, where only 53% of the 104 EBP assessment instruments were considered appropriate for tested validity. The structural validity was appropriate for 50% of the tested instruments. Most used confirmatory factor analysis or comparative adjustment index. However, cross-cultural validity was appropriate for only 22% of the instruments tested through the difference between groups or the differential item functioning. This means that most of the instruments identified in this review are appropriate for measuring the construct they propose for which they were developed; however, they present weaknesses in the tests of cross-cultural validity. This condition can make using these instruments in certain countries or cultures difficult. Because the constructs used by the instruments for assessing the use of EBP in health professionals do not have a gold standard, it was impossible to determine the instrument’s criterion validity. We only considered; the validity correlated the scores with another tool that measures the same construct (construct validity).

The reliability was considered appropriate (sufficient) in 76% of the instruments allows us to affirm that most identified instruments are consistent and reliable for measuring the use of EBP in health professionals. The evaluation considered an intraclass correlation or Kappa-weighted correlation coefficient ≥0.70 for the classification. However, many studies have used other variables to assess the reliability of the instruments. The results may justify the identification of the risk of bias for the properties of the tested measures and the evidence’s moderate or low overall quality in 50% of the studies included in this review.

The COSMIN checklist used in our study also considered the responsiveness of the instruments. However, less than half of the instruments tested (29%) were classified as appropriate (sufficient) by the COSMIN checklist. These findings show a weakness in assessing the responsiveness of EBP assessment instruments in health professionals. Little responsive instruments are unable to detect changes in a test over time. This inability is decisive for the quality of a measuring instrument. Furthermore, it is possible that the risk of bias, present in 46% of the studies, is not related to the size of the samples but the properties of the tested measures.

We used the COSMIN checklist to assess the included studies’ methodological quality and classify each evaluated measured property. This ensured a systematic and transparent collection and evaluation of information, as well as an overview of the measurement properties of the instruments. It also made it possible to recommend the most appropriate instruments to assess the use of EBP in health professionals. These guidelines for analyzing the methodological quality of the studies had not been used in the study by Shaneyfelt et al. (2006). This analysis was defined using a form developed by the authors.

The seven instruments classified as LEVEL 1 can be considered adequate instruments for the target audience. However, even with the emergence of new instruments, we emphasize that Fresno Test remains the most appropriate instrument to assess the use of EBP in health professionals. Fresno test was developed to evaluate the use of EBP in medical and medical residents. It was described by Shaneyfelt et al. (2006) as a reliable tool to assess all five stages of EBP objectively. It has been adapted for other languages and different health professionals (Argimon-Pallás et al., 2010; Coppenrath et al., 2017; Dizon et al., 2011; Laibhen-Parkes et al., 2018; Lizarondo et al., 2014; Ramos et al., 2003; Rothberg et al., 2013; Silva et al., 2016; Silva & Padula, 2021; Tilson, 2010). This instrument can be an alternative to evaluate the use of EBP in the professions less evident in our study.

Some limitations must be considered when interpreting the results of this review. It is possible that we have yet to identify some assessment instruments due to the variability of terms used in the literature related to EBP. However, we searched several databases, including those that contain unpublished studies. Also, because the search was limited to English, other relevant studies from other non-English languages in countries may have been missed. This can introduce publication bias if such instruments systematically differ from those in English Journals. As well as the exclusion of studies for not reporting the terms “evidence-based practice or assessment instruments” in the title and/or abstract, may also have biased our analysis. Finally, although the use of the COSMIN checklist to assess the methodological quality of the included studies and to classify each measurement property evaluated contributes to the low risk of bias in our analysis, the characteristics of some EBP assessment instruments may be misclassified, particularly in determining the validity of evidence based on its relationship to other variables.

Thus, this systematic review makes it possible to select the most appropriate instruments for a given purpose and is supported by evidence of good measurement properties. It can also identify gaps in knowledge about the instruments available to assess the use of EBP in this audience. This can be used to design new studies on these instruments.

Conclusion

The systematic review of the instruments used to assess the use of EBP identified consistency and reliability in most instruments to measure the use of EBP in the health professionals in the studies. However, certain health professionals are not represented. FRESNO was the instrument most used by researchers and the one that evaluates the largest number of EBP domains for different health professionals and in different languages.

Author Contributions

All authors contributed to the conception and design of the work, the acquisition, analysis, or interpretation of data, drafted the work or substantially revised it, and have approved the submitted version.
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Supplemental Material

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