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DESIGN AND VALIDITY OF AN INSTRUMENT TO ASSESS HEALTHCARE PROFESSIONALS' PERCEPTIONS, BEHAVIOR, SELF-EFFICACY AND ATTITUDES TOWARD EVIDENCE-BASED HEALTH PRACTICE. I-SABE

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SHORT TITLE: HEALTHCARE PROFESSIONALS' PERCEPTIONS, AND ATTITUDES TOWARD D EVIDENCE-BASED HEALTH PRACTICE

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ABSTRACT

Objectives: To develop and validate an instrument to measure Brazilian healthcare professionals' perceptions, behavior, self-efficacy, and attitudes towards EBP.

Setting: National Register of Health Establishments database (CNES)

Participants: We included clinical health professionals who were working in the Brazilian public health system (Unified Health Care System – SUS)

Outcome: An assessment of perceptions, behavior, self-efficacy, and attitudes towards EBP in the Brazilian public health system.

Methods: This study was conducted in four stages: Development of instrument items, Content Validity, Pilot Study, and Evaluation of Psychometric Characteristics. An Instrument to assess Evidence-Based Health (I-SABE) was developed. Content validity was assessed through the Delphi method. For the extraction of the domains, we used exploratory factor analysis. The orthogonal rotation was performed, according to the Varimax method. Reliability was examined with internal consistency reliability.

Results: Initially, the I-SABE was constructed with five domains: Self-efficacy; Behavior; Attitude; Results / Benefits, and Knowledge and Skills. Content validity was done by 10-12 experts (three rounds). We applied I-SABE to 217 health professionals. Bartlett's sphericity test and the Kaiser-Meyer-Olkin (KMO) index were adequate ($\chi2 = 1455.810$, $p < 0.001$; $KMO = 0.847$). Considering the factorial loads of the items and the convergence between the Scree Plot and the Kaiser criterion, four domains were extracted, explaining 59.2% of the total variance. The internal consistency varied between the domains: Self-efficacy ($\alpha = 0.76$), Behavior ($\alpha = 0.30$), Attitudes ($\alpha = 0.644$), Results /Benefits to the patient ($\alpha = 0.835$).

Conclusions: The results of the psychometric analysis of the I-SABE confirm the good quality of this tool. The I-SABE can be used both in educational activities as well as as an assessment tool among healthcare professionals across different settings.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- The I-SABE was developed through a rigorous process, which involved the integration of evidence from the literature using a theoretical framework, a Delphi survey for the validity of content and psychometric assessments.

- The I-SABE can be used to measure EBP competencies of healthcare professionals, to identify barriers to and facilitators of EBP in clinical practice. In addition, the instrument can be used in educational activities, as well as an assessment tool among healthcare professionals across different settings in order to improve the implementation of evidence-based interventions.

- A possible limitation of an online survey is only participants who had access to the internet could participate.

- The composite reliability was not performed in this research. It is suggested that it be verified using future studies to assess reliability with greater robustness, as well as confirmatory factor analysis, which makes it necessary to compose a larger sample of health professionals to administer the instrument

INTRODUCTION

The Evidence-based health practice (EBP) is identified as one of the most important factors for improving the results and sustainability of health systems and it has become an important competency for health professionals involved in patient care. EBP is defined as the integration of best research evidence with clinical expertise and patient values, [2]. There are several studies of improved patient outcomes following implementation of EPB such as reductions in length of hospital stay and costs, increased patient satisfaction, and the elimination of unnecessary or ineffective practices, [2].

Although the incorporation of scientific evidence as a basis for health decision-making is considered a critical factor to improve quality of care, the application of EPB is remains a major challenge, [3-5]. Studies showed competency gaps and low implementation rates among healthcare professionals across diverse practices and settings. Understanding of knowledge, skills, attitudes, and barriers related to EBP among healthcare professionals can help to elaborate effective and systematic strategies for integrating the EBP in healthcare services, [5].

Many instruments have been developed to assess knowledge, skills, and attitudes toward EBP among healthcare professionals, [6-8]. According to systematic reviews, few studies established psychometric properties and focus on all domains suggested by the classification rubric for EBP instruments in education (the CREATE framework), [6-8]. This fact might limit the ability to evaluate the impact of EBP implementation on health outcomes. The development of a validity instrument is important to determine gaps, to design interventions needed for integrating this competency in healthcare organizations, and to assess the effectiveness of future interventions in different contexts (e.g. hospitals, primary care services), [5].

In Latin America, despite increased efforts to disseminate and apply the EPB concepts, the application of EPB among healthcare professionals is still limited, [9-10]. There is lacking research to support the development of interventions in order to promote the EBP implementation in the clinical routine, [9-10]. In addition, no study developed a validity and reliability instrument to assess the gaps in EPB implementation among healthcare professionals in the Brazilian context. Thus, this study aims to develop and validate an instrument for determining healthcare

professionals' perceptions, behavior, self-efficacy, and attitude related to EBP in Brazil.

METHODS

The development was conducted in a systematic manner, using an accepted measure development methodology which included item development, pilot testing, and psychometric validation. The study was approved by the Ethics Committee (No. 1.425.808), and all participants gave written, informed consent prior to interviews or survey participation. Personally, identifiable information, such as names, phone numbers, and addresses, was not collected from participants in order to fully protect their privacy.

Development and validation of the questionnaire

Development of instrument items

We drew upon the conceptual EBP framework (i.e.: knowledge, behavior, and attitude) proposed by the "Classification Rubric for Evidence-Based Practice Assessment Tools in Education" (CREATE), [11-12]. This framework was achieved taking into count 104 tools found in a systematic review, [13]. We also used the existing scales in EBP [14-20] to garner candidate items and to group them into domains pointed by the mentioned systematic review (EBP knowledge, attitude toward EBP, application/use of EBP, and practitioners' EBP behavior in the clinical setting).

Content Validity

Content validity assessment refers to the instrument judgment, if the instrument truly comprehends the different aspects of its object and, at the same time, does not involve elements that could be related to other objects. This could be done using the results of several examiners' analyses (examiner-judges or panel of experts) who verify the items representation regarding content areas and the relevance of the

objectives to be measured. We used a panel of experts through a consensus technique, according to simplified Delphi's method, [21].

The Delphi method is a structured process distributing rounds of the questionnaire in analysis to gather information and set priorities or gain consensus regarding a specific issue. This method is characterized by anonymity, iteration, controlled feedback, and stability in responses among those with expertise on a specific issue. The Delphi technique was conducted in online web surveys where the panel of experts filled out the form given their responses directly and blinded from others, [22].

Selection of experts

The panelists were identified through an advanced search system of the Lattes platform on the National Council for Scientific and Technological Development (CNPq) website, using the following keywords: evidence-based health, evidence-based health practices, evidence-based medicine, questionnaire, measurement instruments, questionnaire validation, and psychometric analysis.

The following criteria were used for selecting a panel of experts: publication of at least three scientific articles on EBP practices or projects/articles that involved validation of questionnaires in the health area published in the last four years, or professional practice with experience in EPB. We identified 25 potential participants who were then invited by email. Each potential panelist was informed about the voluntary nature of the study and was provided with full study information, outlining the aim of the study, the extent, and timing of their expected involvement.

Rounds

We planned at least three rounds. During the rounds, the panel board members were invited to comment on grammar and phrasing to improve uniform interpretation of items and prevent socially desirable responses, if they suggest additional items or dimensions. The content assessment was done considering Theoretical Dimension, Theoretical Relevance, Clarity, and Relevance or representativeness as well explained in our protocol, [23]. For each item in the questionnaire, we used the traditional 4-point Likert scale that ranged from one

point (completely disagree) to four points (completely agree). Follow each item, a space was included for panelists to write their suggestions for improving the item or making comments. If the expert marked the answer I completely disagree with or disagree with, he must justify his answer. The experts were also offered the opportunity to add items. Doubts about comments or suggestions were resolved with the experts by telephone or email. After each round, the results and comments were analyzed and summarized by the research team in order to guide the instrument revision. The modified instrument was again sent to the panelist group for the next round of analysis. Each round lasted 30 days corresponding to 15 days for the panelists' answers and another 15 days for the researchers' analysis

Descriptive analyses

After each round, data generated from completing the online questionnaire were extracted to Microsoft Excel for descriptive analysis (frequencies and percentages) in order to determine the percentage rating of agreement or disagreement among experts.

Determining consensus

The Consensus was reached if at least 80% of the participants' votes agreed to maintain or exclude the assessed item. We made qualitative changes to items that were suggested by a panelist who had robust scientific and rational consistency. The modified item was returned to the vote in the next round even if it had minor editing,

Criteria for dropping items at each round

If 80% or more of the participants' votes completely disagree or disagreed, the item was excluded from the instrument. After the end of content validation, this stage was complemented with exploratory factor analysis.

Feedback

Quantitative (percentage rating) and qualitative feedback from each round of the Delphi process were incorporated into the survey for the next round. The expert panel was instructed to consider the feedback.

Anonymity

The anonymity of panelists was ensuring during the Delphi process.

Pilot Study

In order to identify possible doubts regarding the understanding of the items, panelists were asked to indicate health professionals to answer the instrument. Each panelist appointed three health professionals, totaling 36 potential participants. Of these, 28 agreed to participate in the research.

Evaluation of Psychometric Characteristics

Study design: this step is a cross-sectional study, with a random sampling design.

Setting

We gathered the survey participants from the National Register of Health Establishments database (CNES), which hosts with free access to data all public health institutions of Brazil. Queries on CNES can be performed at http://cnes.datasus.gov.br/ filtering by geographic location (i.e. State and Municipality), and type of establishment. It also provides the name, role, workload, and employment contract of each healthcare professional. We selected only medical professionals, nurses, dentists, and pharmacists who are working in Brazil's public health sector (Unified Health Care System - SUS).

Participants

We included clinical health professionals who are currently working in the public health system and excluded professionals on leave from work for limited or unlimited time during the period of application of the questionnaire, or retired professionals.

Study size

The estimated minimum sample size was based on the requirement of 10 subjects per model parameter, [24]. In 2016, government database registered 240,750 physicians; 182,861 nurses, 58,421 dentists, and 20,593 pharmacists. Thus, we choose to work with a representative sample bigger than that recommended for the statistical analysis. Considering a 30% response rate, we estimate a sample size of

1,270 respondents needed to answer one of our questions (percentage of prior contact, familiarity with EBP), with 5% precision. To obtain this precision we dichotomized the first item of the survey (being favorable or not to EBP) assuming maximum variability (50% of responses favorable to EBP). A confidence interval of 95% was applied to the percentage of favorable responses.

Randomization

The research sample was selected randomly in a central computer considering some stratifications, e.g. type of professional, geography, settings, etc. We recruited potential participants through email with an invitation letter containing a link to the web-survey. Professionals without e-mail addresses available in CNES were be contacted by phone or fax at their workplace and will be sent a physical survey by postal mail to their work addresses.

Data collected

After health professionals agreed to participate in the study, the instrument I-SABE was sent *online* through the *survey monkey* platform (https://pt.surveymonkey.com/).

Data Analysis

Psychometric sensitivity

The summary and shape measures of the questionnaire items distribution were used to estimate their psychometric sensitivity. Items with a skewness (Sk) greater than 3 and kurtosis (Ku) greater than 7 in absolute values are considered to have psychometric sensitivity issues, [24]. The diagnosis of multivariate outliers is to be performed by computing the Mahalanobis distance, [24].

Factorial validity

Exploratory factor analyses (EFAs) were conducted by using Principal Axis Factoring in order to partition systematic and error variance in the solution [25, 26]. Promax oblique rotation was be used, allowing for factor inter-correlations. To

promote simple structure, items were retained on a factor if they load at least 0.30 on the primary factor and less than .30 on all other factors, [25].

Reliability

The reliability of an instrument used for data collection is its coherence, determined by the constancy of the results. A reliable (stable) measure is consistent and precise because it provides a constant measurement of the variable, [27]. To estimate the reliability, both the internal consistency and stability were evaluated.

We explored internal consistency, that is, the reliability estimated from the internal consistency, by using standardized alpha Cronbach coefficient (α), where Cronbach α of 0.7 to 0.8 is considered satisfactory, 0.8 to 0.9 is good, and 0.9 is excellent, [28].

Patient and public involvement

No patient involved.

RESULTS

Development and validation of the questionnaire

Elaboration of instrument items

Considering the theoretical framework adopted and the guidelines of the CREATE methodology, initially we developed a preliminary instrument containing 31 items across five domains: Self-efficacy, Knowledge, Behavior, Attitudes, Results/Benefits to the patient, and Skills, Supplementary Appendix 1. The instrument was named I-SABE (Instrument to assess Evidence-Based Health)

Content Validity

Three rounds of expert's panel were carried out in order to assess the preliminary instrument. Of the 15 potential experts selected, 12 (80%) agreed to participate in the study. The second round of instrument evaluation had the participation of 10

(66.7%) experts and the third had 10 (66.7%) participants. The majority of respondents completed the questionnaire between 15 to 20 minutes.

In the first round, the experts identified items that were not clear or confused. This process resulted in the exclusion and convergence of items according to consensus adopted. Thus, four items out of 31 instrument items were removed, resulting in 27 remaining items.

Some experts highlighted the need to include new items, for example, in the "Attitude" domain, the following items were included: "The practice of EBP increases the satisfaction of the person in my care" and "The practice of EPB provides an outlet of decision shared with the person in my care ".

In the second round, a consensus was reached for 100% of the domains selected. However, experts emphasized the importance of characterizing the health professional's practice, suggesting the inclusion of items that reflect clinical practice. Thus, after the second round, two items were included, resulting in a total of 31 items. These items and the Knowledge and Skill domains were not included in the analysis stage of psychometric characteristics, as these questions are not measuring latent variables.

In the third round, experts reached a consensus on the two items suggested in the previous round. At the end of the content validity, the instrument I-SABE was finalized with 31 items across five domains. All changes, inclusion, and exclusion of the items are described in Supplementary Appendix 2.

Pilot study

After the content validity, the instrument was applied to a sample of 28 health professionals which included physicians, nurses, and pharmacists. Based on responses from health professionals, we modified the item 12 "Time is a factor that favors my use of SBE". This item was considered as an incomprehensible item. The item was reevaluated with members of the expert committee and changed to "I don't use EBP because I don't have time". At the end of this stage, 77.7% of the participants reported not feeling any difficulty in filling out the I-SABE instrument and the average completion time was 12 minutes.

These modifications were included in the new version of I-SABE included which was submitted to the assessment of validity and reliability. The duration of each

interview was between 24 and 66 minutes. The mean time that participants took to complete the questionnaire was 12 minutes. The perceived length of the same was deemed appropriate for most participants (88%). The mean perceived difficulty of the questionnaire was 2 (0 = very easy; 10 = very difficult).

Development of Psychometric Characteristics

Participants

Of the 2,550 health professionals listed, 1,380 subjects were recruited from a random sampling. At the end of this stage, the response rate was 15%, Figure 1.

The demographic and academic characteristics of 217 Brazilian health professionals who participated in the study were summarized in Table 1. The majority of sample were women (n=148; 69.5%), pharmacist (n=84; 77.5%), have specialization degree (n=90; 41.5%), and work in primary care (n=70; 32.3%). Detailed characteristics of survey respondents are presented in table 1.

Psychometric sensitivity

Skewness and Kurtosis are within the commonly agreed-upon thresholds of lower than 1 for skewness and lower than 3 for kurtosis, indicating a normal distribution of the I-SABE, and, therefore, an adequate psychometric sensitivity, Table 2.

Factorial validity

The sample suitability indices presented good conditions for the factorial analysis: Kaiser-Meyer-Olkin (KMO) of 0.847 and Bartlett's sphericity with $p < 0.001$, Table 3 Visual inspection of the scree plot (Figure 2) revealed that the point of inflexion in the plot occurred at the fifth factor, indicating that four factors should be retained. Varimax orthogonal rotation allowed a more precise classification of each of the factors (domains), Table 4.

The analysis revealed four factors whose eigenvalues were > 1, accounting for 52.6% of the total variance in the measure. After the completion of this step, item 16 was excluded since it is an open question and does not fit on a Likert scale. Item 9 was also removed because it presented a confounding factor and with a factor load below 0.4. The final instrument is described in Supplementary Appendix 3.

Reliability

The reliability of the I-SABE instrument was assessed by Cronbach's alpha, the values were calculated for each factor, as described in Table 5.

DISCUSSION

The robustness of the results of a study depends on the quality and validity of the instrument used. This study presented the development and the initial validation process of an instrument (I-SABE) to verify different aspects of EPB, using a rigorous methodology. Our findings demonstrated that the I-SABE has an overall good level of psychometric properties measured as content and factorial validity, internal consistency reliability in order to measure the four domains of EBP among the different types of health professionals (physicians, pharmacist, dentist, nurse, physiotherapist), indicating that this instrument is an efficient and effective instrument for use in research and clinical settings.

Although several tools combine more than one domain of EBP assessment in a single instrument, these predominantly focus on certain domains (i.e. knowledge and skills) and EBP steps (i.e. appraise), [6, 29-32]. To our knowledge, I-SABE is the first tool that has addressed the following four domains in a single instrument: 1-Self-efficacy; 2- Behavior; 3-Attitude and; 4-Results / Benefits.

The I-SABE was designed to evaluate EBP across a range of healthcare professionals with different levels of experience in Brazil. Two instruments that assess EBP competencies have been culturally adapted and validated in Brazil, [33-34]. However, these instruments were developed to assessed EPB in specific populations such as medical students and nurses. Furthermore, in the literature, few validation studies were developed with a multidisciplinary sample, [35]. However, for EBP to be fully implemented, it is essential to clarify possible differences among healthcare professionals since the EBP is a shared competency.

Regarding the five domains evaluated, the “self-efficacy" domain had a high factor load for the items and demonstrated a good correlation with the items, suggesting an adequate construction that allows measuring the self-efficacy of health professionals in the use of EBP. The domain "results/benefits for the patient" accurately also reflects the content of the item and the direction of the I-SABE. This

domain is considered an important aspect of EBP since it focuses on the impact of EBP on practice and results, [12].

The internal consistency of I-SABE was assessed by Cronbach's alpha. Some authors recommend that Cronbach's alpha value must be at least between 0.60 and 0.70 in order to have a reliable instrument, [36-37]. Based on this evidence, it can be observed that Self-efficacy, Results /Benefits to the patient, and Attitude domains show adequate internal consistency.

On the other hand, we observed a lower internal consistency of the "behavior" domain. Low internal consistency suggested that the items within the construct of "behavior" were low correlated. A possible explanation might be the low number of items ($n = 3$) in this domain. Cronbach's alpha values are quite sensitive to the number of items in the scale, and with short scales (< 10 items) it is common to find quite low Cronbach's alpha values.

This limitation is in agreement with the findings reported for other studies. For instance, in the validation study of the ACE scale (Assessing medical trainees' competency in evidence-based medicine), the authors identified a low internal consistency to questions about a critical appraisal, with specific reference to selection and performance bias, [38]. Findings from the evidence-based practice scale (EBP-KABQ) also observed lower internal consistency of the "knowledge" domain compared to other items, suggesting that the six items within this construct were not adequately correlated, [39].

Finally, Although the "Knowledge and Skill" domain was not included in the analysis stage of psychometric characteristics since these questions are not measuring latent variables. The I-SABE considered the requirements from the CREATE framework, examining user knowledge and skills across the steps 1–4 of the EBP process, [12].

Strengths and Limitations

This study was developed through a rigorous process, which involved the integration of evidence from the literature using a theoretical framework, a Delphi survey for the validity of content and psychometric assessments. As a strength, we use the CREATE taxonomy as a framework to elaborate and the instrument, [12]. This framework has been developed by a specialist group and describes seven areas of evaluation of EBP educational interventions, out of which five were used as a

framework for the I-SABE. Secondly, the content of the instrument was based on a literature review and was validated by a panel of experts and was pretested, which strengthened its validity.

Thirdly, we performed a simple random sampling of Brazilian healthcare professionals to select the participants of the study. Although the sample was relatively low when compared to the total number of professionals previously selected, the number of 217 healthcare professionals was sufficient to perform factors analysis since sample size calculation was based on a participant to item ratio of 5:1, [40].

However, there are some limitations to this study. A possible limitation of an online survey is only participants who had access to the internet could participate. This might have increased the participation rate of healthcare professionals with lower time since graduation. The composite reliability was not performed in this research. It is suggested that it be verified using future studies to assess reliability with greater robustness, as well as confirmatory factor analysis, which makes it necessary to compose a larger sample of health professionals to administer the instrument.

Implications for clinical practice and future research

The I-SABE was found to be a valid and reliable instrument to assess self-efficacy, behavior, attitude, and results /benefits toward EPB in Brazil. This tool can be used to measure EBP competencies of healthcare professionals in Brazil and to identify barriers to and facilitators of EBP in clinical practice in order to improve the implementation of EBP. In addition, the instrument can be used in educational activities, as well as an assessment tool among healthcare professionals across different settings.

Conclusion

The I-SABE is a valid and reliable instrument to assess the EBP among healthcare professionals. The application of this instrument is simple, quick, and provides a reliable assessment of the EBP in the main stages of the execution of the EBP in order to favor their implementation. Future research is required to further examine other psychometric properties of I-SABE and its utility in patient care.

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Table 1- Demographic, academic, and setting of work characteristics of participants.

Characteristics	N=217 (%)
Sex	

Female	148 (72.7)
Male	69 (30.8)
Profession	
Physician	67 (31.5)
Pharmacist	84 (77.5)
Nurse	37 (17.4)
Dentist	4 (1.9)
Physiotherapist	10 (4.7)
Others	11 (5.2)
Time since graduation	
< 10 years	95 (43.8)
11-20 years	88 (40.5)
> 20 years	34 (15.7)
Education/ Highest professional degree	
Post-doctoral	14 (6.3)
Doctorate	23 (10.4)
Master's degree	57 (25.8)
Specialization degree	90 (41.5)
Graduate degree	33 (14.9)
Setting of work	
Primary care	70 (32.3)
Hospital	54 (24.9)
Outpatient clinic/private practice	35 (16.1)
University	43 (19.8)
Others	15 (6.9)

Table 2- Summary and shape measures of instrument I-SABE

Items	Mean	Median	Standard deviation	Skewness	Kurtosis

3	1.98	2.00	1.02	1.30	2.95
4	2.18	2.00	1.22	1.43	2.17
5	2.35	2.00	1.06	0.80	0.76
6	2.49	2.00	1.06	0.83	0.75
7	1.61	1.00	0.83	1.49	2.37
8	2.10	2.00	1.06	0.96	0.67
9	2.55	2.00	1.44	1.29	1.37
10	3.10	3.00	1.69	0.66	-0.62
11	4.25	4.00	1.48	0.12	-1.09
12	5.20	6.00	1.45	-0.43	-0.99
13	5.30	6.00	1.42	-0.76	-0.13
14	2.10	2.00	1.05	1.21	2.88
15	3.05	3.00	1.37	0.73	0.13
16	5.05	5.00	1.59	-0.06	-0.56
17	6.04	6.00	1.14	-1.69	3.65
18	5.59	6.00	1.43	-1.03	0.46
19	2.26	2.00	1.11	1.15	1.77
20	2.22	2.00	0.96	0.91	1.44
21	2.36	2.00	1.00	0.92	1.38
22	2.48	2.00	1.12	0.86	0.69
23	2.69	3.00	1.14	0.66	0.39

2

Table 3 - Value of Kaiser-Meyer- Olkin and Bartlett's Tests

Tests		Results
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.847
Bartlett's Test of Sphericity	Approx. Chi-Square	1455.810
	Df	210
	Sig.	0.000

Table 4- Factor structure matrix with orthogonal varimax rotation of instrument I-SABE.

Item	Factorial analysis			
	1	2	3	4
1. I am able to incorporate evidence from scientific literature into my practice.	0.171	**0.611**	-0.183	0.359
2. I am able to access the best evidence of scientific literature in the time I need them.	-0.021	**0.773**	-0.155	-0.063
3. I am able to critically evaluate the evidence from the scientific literature.	0.133	**0.762**	-0.120	-0.050
4. I am able to keep up to date with the evidence	0.177	**0.778**	0.029	0.029
5. I am sure that the implementation of Evidence-Based Health (EBP) improves my clinical or professional practice.	**0.623**	0.039	-0.179	0.094
6. I use evidence from research to support my clinical decisions	0.410	0.303	0-.224	**0.539**
7. I ask colleagues for help in consulting the scientific literature to find answers to my clinical questions.	0.015	0.059	0.068	**0.641**
8. I ask colleagues for help in consulting the scientific literature to find answers to my clinical questions.	-0.092	-0.034	0.062	**0.650**
9. I prefer to use my experience to make clinical decisions	**0.373**	-0.063	**0.369**	**0.370**
10. I adopt the EBP practice because my colleagues do it.	0.104	0.007	**0.631**	0.265
11. It is difficult to change my practice to use EBP	-0.375	-0.375	**0.582**	0.078
12. EBP makes me feel confident in my clinical decisions.	**0.668**	0.048	-0.206	0.116
13. I feel that EBP considers my clinical or professional experience.	**0.538**	0.321	0.204	0.109
14. I don't use EBP because I don't have time	0.023	-0.399	**0.633**	-0.021
15. I feel that EBP worsens the quality of my clinical decisions.	-0.325	-0.085	**0.582**	-0.019
16. I do not adopt the EBP for any other reason (specify)	-0.316	-0.316	**0.582**	-0.189
17. EBP positively affects my clinical decisions.	**0.667**	0.070	-0.466	0.094
18. EBP positively affects the health results of the person under my care.	**0.701**	0.048	-0.323	0.032
19. New research evidence results in a change in my practice.	**0.609**	0.042	-0.222	0.149
20. EBP provides a decision-making shared with the person under my care.	**0.725**	0.160	0.101	-0.101

21. EBP increases the satisfaction of the person under my care.	**0.754**	0.121	-0.021	-0.152
Values	**5.838**	**2.110**	**1.847**	**1.242**
Explained Variance	**27.801**	**10.048**	**8.795**	**5.913**

*I-SABE: Instrument to assess evidence-based health

Table 5 - Cronbach's alpha values for each factor (domain)

Factor	*Cronbach's Alpha*	*Cronbach's Alpha Based on Standardized Items*	Number of Items
Self-efficacy	0,762	0,764	4
Behavior	0,302	0,322	3
Attitudes	0,644	0,650	4
Results	0,835	0,840	5

Figure 1. Flowchart of sample composition

Figure 2. Scree plot graphic

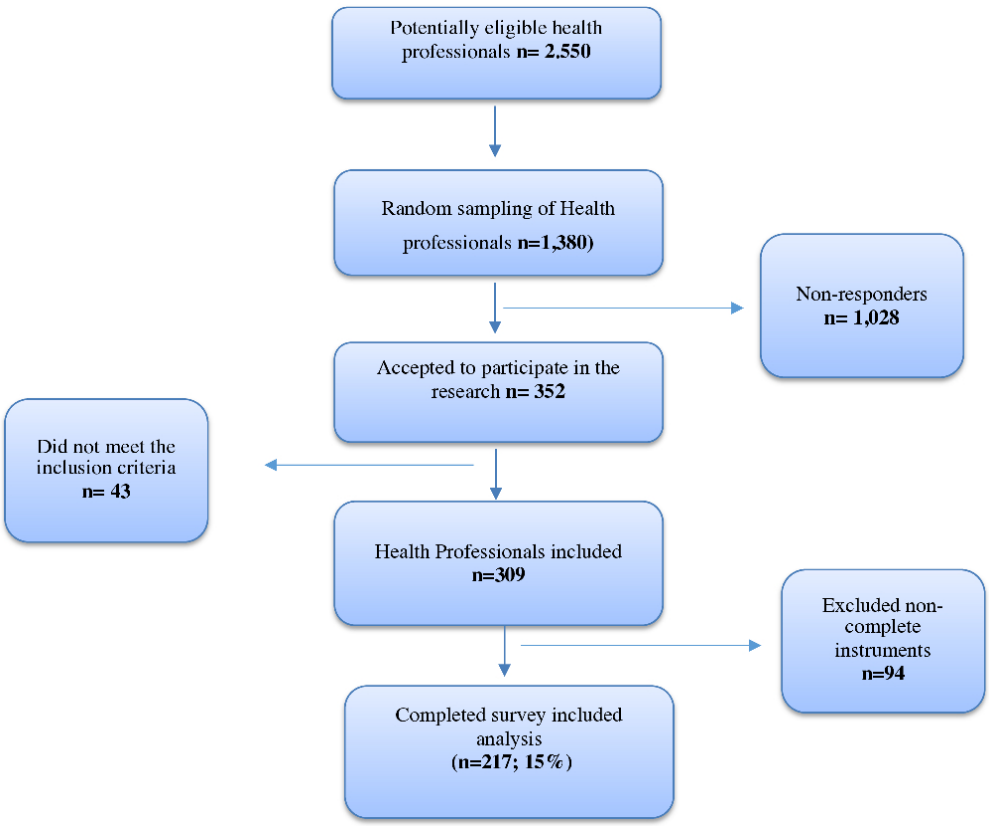

Figure 1

170x140mm (150 x 150 DPI)

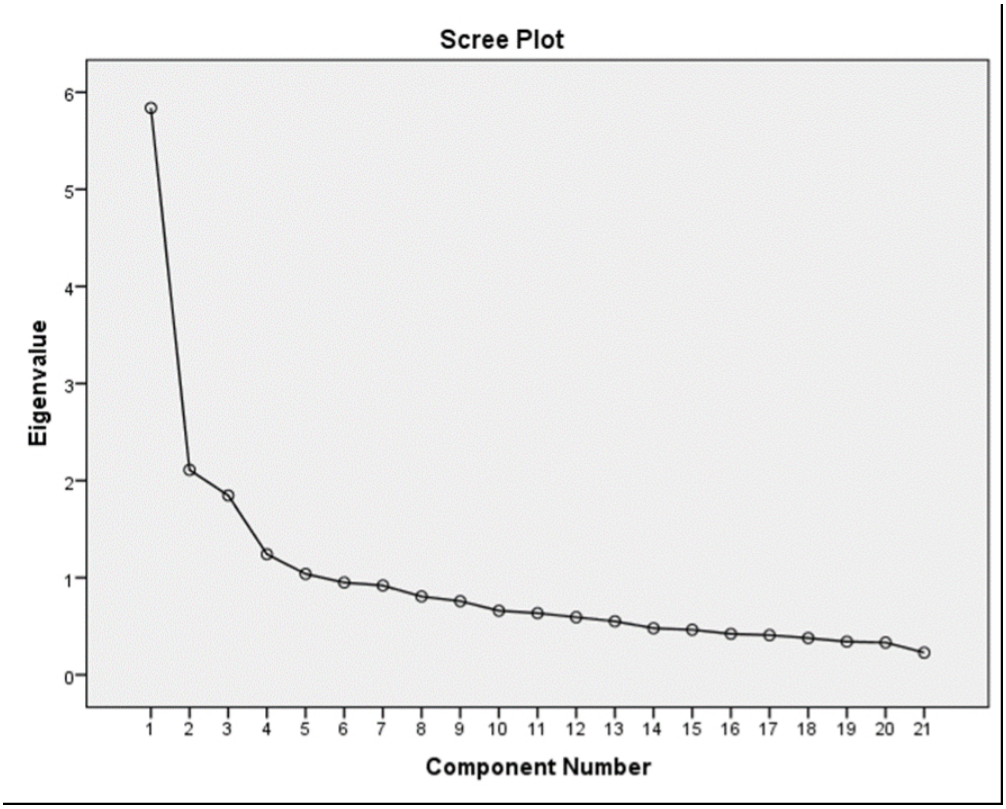

Figure 2

APPENDIX 1 - Definition of domains in SBE practices.

Domain	Definition
Self-efficacy	It refers to people's judgments regarding their ability to perform a certain activity (BANDURA, 1977). For example, an individual's confidence in his or her ability to search for evidence may be related to his or her efforts to search for scientific evidence (SALBACH et al., 2009).
Knowledge	It is attributed to the concepts about SBE. Knowledge assessments can measure an individual's ability to define SBE concepts, list basic EBP principles or characterize levels of scientific evidence. Thus, knowledge assessment questions can ask health professionals to define the "Number Needed to Treat" or identify the "type of study" most appropriate to answer a given clinical question (TILSON et al., 2011).
Behavior	It refers to the individual's real performance in his practice. As for example, the professional changes his service after analyzing a synthesis of evidence (TILSON et al., 2011)
Attitudes	Attitudes are strong indicators of future behavior (AJZEN, 1991) There is evidence that individuals' confidence in the benefits of evidence-based practices are related to the degree that they implement the practice of EBP in their work (MEINYK et al., 2017).
Results / Benefits to the patient	The goal of EBP is to improve health care outcomes for patients. Therefore, it is essential to assess the impact of EBP on the benefit of patients (STRAUS et al., 2004) (NABULSI et al., 2007).
Skills	Skills refer to the application of knowledge, ideally in a practical environment (FREETH et al., 2006) Skill assessment would require clinicians to "do" a task associated with EBP, such as conducting research, use a critical assessment tool to summarize the quality of the study, for example, or

	calculating the number needed to treat (TILSON et al., 2011).

APPENDIX 2 - Changes to the items that make up the I-SABE, during content validation.

I-SABE inicial	I-SABE após validação de conteúdo
Autoconfiança	
1-Estou confiante na minha capacidade para adotar a prática da saúde baseada em evidências	1-Eu sou capaz de incorporar na minha prática a evidência proveniente da literatura científica.
2-Eu me sinto capaz de encontrar a melhor evidência disponível	2-Eu sou capaz de acessar as melhores evidên literatura científica, no tempo que necessito dela
3-Eu sinto que sou capaz de avaliar criticamente a evidência proveniente de minha busca da literatura científica.	3-Eu sou capaz de avaliar criticamente a evidência proveniente da literatura científica.
4-Eu sinto que sou capaz de aplicar a evidência proveniente da pesquisa ao cuidado de pacientes individuais.	4- Eu sou capaz de manter-me atualizado em relação às evidências.
5-Sinto-me capaz de manter-me atualizado em relação às evidências.	5- Estou certo de que a implementação da Saúde Baseada em Evidência (SBE) melhora minha prática clínica ou profissional.
6-Sinto-me capaz de acessar (buscar e encontrar) as melhores evidências clínicas no tempo em que necessito delas	
7-Tenho certeza sobre como medir os resultados de minha própria prática clínica.	
8-Tenho certeza sobre como medir os resultados de minha própria prática clínica.	
Atitude	
9- Eu, frequentemente, uso evidências provenientes de pesquisa para apoiar as minhas decisões clínicas.	6- Eu uso as evidências provenientes de pesquisa para apoiar as minhas decisões clínicas.
10-Eu peço ajuda aos colegas na pesquisa da literatura científica para encontrar respostas às minhas perguntas clínicas.	7- Eu peço ajuda aos colegas na consulta à literatura científica para encontrar respostas às minhas perguntas clínicas.
11-Quando as evidências da pesquisa não suportam minhas rotinas clínicas confiáveis, sinto-me desconfortável.	8- Eu me sinto desconfortável quando as evidências de pesquisa não sustentam minhas práticas clínicas ou profissionais.
12-Eu prefiro usar minha própria experiência para tomar minhas decisões clínicas	9- Eu prefiro usar minha experiência para tomar decisões clínicas.
13-Eu, raramente, procuro evidências de pesquisa disponíveis para responder a minha pergunta clínica diária.	
14-Eu frequentemente, pelo menos duas vezes por semana, acesso a evidência fornecida pelo Cochrane	
Comportamento	

15-Eu uso a prática SBE por que meus colegas o fazem.	10-Eu adoto a prática da SBE porque meus colegas o fazem.
16-Eu não uso prática SBE porque é difícil de mudar a minha prática	11- É difícil mudar a minha prática para usar a SBE.
17-SBE me faz sentir autônomo em minhas decisões clínicas	12- A SBE me faz sentir confiante em minhas decisões clínicas
18-Eu sinto que a SBE desconsidera minha experiência clínica.	13- Eu sinto que a SBE considera minha experiência clínica ou profissional.
19-Eu não uso SBE porque eu não tenho tempo.	14- Eu não uso a SBE porque não tenho tempo
20- Eu sinto que SBE piora a qualidade das minhas decisões clínicas.	15- Eu sinto que a SBE piora a qualidade das minhas decisões clínicas.
21- Eu não uso SBE em minha prática clínica por outra razão (especifique)	16- Eu não adoto a prática da SBE por outra razão (especifique).
Resultados/Benefícios ao paciente	17- A prática da SBE afeta positivamente minhas decisões clínicas.
22-Quanto o uso da prática SBE afetou os resultados do paciente?	18- A prática da SBE afeta positivamente os resultados em saúde da pessoa sob meus cuidados.
23-Quanto o uso da prática SBE afetou suas decisões clínicas?	19- Novas evidências de pesquisa resultam em mudança na minha prática.
24-Com que frequência novas evidências de pesquisa resultam em uma mudança em sua prática?	20- A prática da SBE propicia uma tomada de decisão compartilhada com a pessoa sob meus cuidados.
25-A instituição onde trabalho (nos casos de atuar em duas instituições, responda considerando aquela que dedica maior número de horas) já implementou práticas de SBE.”	21- A prática da SBE aumenta a satisfação da pessoa sob meus cuidados.
Conhecimento	
26-Os ensaios clínicos e os métodos observacionais são igualmente válidos no estabelecimento de efetividade de um tratamento.	22-Os ensaios clínicos e os métodos observacionais são igualmente válidos no estabelecimento de efetividade de um tratamento.
27- Viés de publicação (Funel plot) em uma metanálise representa viés de seleção.	23-Viés de publicação em uma metanálise representa viés de seleção.
28- A randomização em um ensaio clínico ajuda a reduzir o tamanho amostral.	24- A randomização em um ensaio clínico ajuda a reduzir o tamanho amostral.
29- Estudos transversais são os melhores delineamentos para avaliar fatores prognósticos.	25-Estudos transversais são os melhores delineamentos para avaliar fatores prognósticos.
30- Um recente ensaio clínico randomizado descobriu que 29% dos diabéticos com doença coronariana	26- Um recente ensaio clínico randomizado descobriu que 29% dos diabéticos com

tratados com pravastatina, apresentaram evento coronariano recorrente durante cinco anos de seguimento. Enquanto que, no grupo placebo, 37% sofreram eventos coronarianos recorrentes. A redução absoluta do risco para eventos recorrentes é 8%. A redução do risco relativo para eventos recorrentes é 22%. O número necessário para tratar para prevenir um evento recorrente é 12,5.	doença coronariana tratados com pravastatina, apresentaram evento coronariano recorrente durante cinco anos de seguimento. Enquanto que, no grupo placebo, 37% sofreram eventos coronarianos recorrentes. A redução absoluta do risco para eventos recorrentes é 8%. A redução do risco relativo para eventos recorrentes é 22%. O número necessário para tratar para prevenir um evento recorrente é 12,5.
31- O estudo recente HERS comparou mulheres que utilizam reposição hormonal com estrogênio versus mulheres que utilizaram placebo. Os resultados revelaram um risco relativo de eventos tromboembólicos de 2,89 para as mulheres que usaram estrogênio. Isso sugere que o tratamento com estrogênio representa risco coronariano. Para que esta diferença seja estatisticamente significante, deve-se verificar o intervalo de confiança. Um exemplo de intervalo de confiança que nos levaria a concluir que a taxa de eventos tromboembólicos venosos foi de fato (estatisticamente) diferente para estes dois grupos de tratamento seria algo que englobe 2,89 e inclui o 1,0 dentro do intervalo.	27- O estudo recente HERS comparou mulheres que utilizam reposição hormonal com estrogênio versus mulheres que utilizaram placebo. Os resultados revelaram um risco relativo de eventos tromboembólicos de 2,89 para as mulheres que usaram estrogênio. Isso sugere que o tratamento com estrogênio representa risco coronariano. Para que esta diferença seja estatisticamente significante, deve-se verificar o intervalo de confiança. Um exemplo de intervalo de confiança que nos levaria a concluir que a taxa de eventos tromboembólicos venosos foi de fato (estatisticamente) diferente para estes dois grupos de tratamento seria algo que englobe 2,89 e inclui o 1,0 dentro do intervalo.
Habilidades	
	28- Marque as opções que traduzem os seus desafios para implementar as práticas da SBE (selecione as três opções mais importantes)
	29.Na minha prática utilizo protocolos clínicos elaborados por (Selecione as opções possíveis): ( ) Ministério da Saúde ( ) Sociedades Científicas Brasileiras ( ) *Guidelines* Internacionais (ex.: NICE) ( ) Pelo Hospital, Instituto ou local que trabalho ( ) Por mim mesmo, com base em leituras de estudos científicos e meu *background* **( )** Não utilizo protocolos na minha prática
	30- Abaixo estão alguns termos relacionados com a apresentação dos resultados das

	investigações clínicas. Marque seu grau de familiaridade com eles.
	31- Existem vários recursos disponíveis voltados para as práticas da SBE. Informe as plataformas que você já consultou.

APPENDIX 3 - Changes to I-SABE items after psychometric analysis - Final Instrument

Práticas de Saúde Baseadas em Evidências

Esta é uma pesquisa destinada a avaliar vários aspectos da prática de saúde baseada em evidências. Por favor, responda com sinceridade (ou seja, não nos conte o que você PENSA que queremos ouvir, em vez de nos dizer o que realmente acredita) e complete todas as perguntas. Todas as respostas serão tratadas em estrita confiança e vistas apenas por assistentes de pesquisa independentes. Todas as identidades individuais serão mascaradas e a análise dos dados será cega. Somente os resultados agregados serão publicados.

Obrigado por sua participação.

Marque as opções que traduzem sua atuação profissional (selecione as opções possíveis):

a. ( ) Atuo no atendimento clínico de pessoas

b. ( ) Atuo na tomada de decisão em saúde, no cargo de gestor ou em comissões gestoras

c. ( ) Desenvolvo protocolos ou diretrizes clínicas

d. ( ) Ministro disciplinas (em nível de graduação ou de pós-graduação) que envolvem assistência à saúde de pessoas

e. ( ) **Nenhuma das anteriores.** (Passe diretamente a responder o perfil sócio-demográfico)

Por favor, circule a resposta mais apropriada:	Concordo plenamente	Concordo	Concordo parcialmente	Neutro	Discordo parcialmente	Discordo	Discordo plenamente
1. Eu sou capaz de incorporar na minha prática a evidência proveniente da literatura científica.	7	6	5	4	3	2	1
2. Eu sou capaz de acessar (buscar em bases eletrônicas, usando estratégias de busca e encontrar) as melhores evidências da literatura científica, no tempo que necessito delas.	7	6	5	4	3	2	1
3. Eu sou capaz de avaliar criticamente a evidência proveniente da literatura científica.	7	6	5	4	3	2	1
4. Eu sou capaz de manter-me atualizado em relação às evidências.	7	6	5	4	3	2	1

Por favor, circule a resposta mais apropriada	Concordo plenamente	Concordo	Concordo parcialmente	Neutro	Discordo parcialmente	Discordo	Discordo plenamente
5. Eu uso as evidências provenientes de pesquisa para apoiar as minhas decisões clínicas.	7	6	5	4	3	2	1
6. Eu peço ajuda aos colegas na consulta à literatura científica para encontrar respostas às minhas perguntas clínicas.	7	6	5	4	3	2	1
7. Eu me sinto desconfortável quando as evidências de pesquisa não sustentam minhas práticas clínicas ou profissionais.	7	6	5	4	3	2	1
8. Eu prefiro usar minha experiência para tomar decisões clínicas.	7	6	5	4	3	2	1

Por favor, circule a resposta mais apropriada: atitude	Concordo plenamente	Concordo	Concordo parcialmente	Neutro	Discordo parcialmente	Discordo	Discordo plenamente
9. Eu adoto a prática da SBE porque meus colegas o fazem.	7	6	5	4	3	2	1
10. É difícil mudar a minha prática para usar a SBE	7	6	5	4	3	2	1
11. Eu não uso SBE porque eu não tenho	7	6	5	4	3	2	1
12. Eu sinto que a SBE piora a qualidade das minhas decisões clínicas.	7	6	5	4	3	2	1

Por favor, circule a resposta mais apropriada:	Completamente	Muito	Moderadamente	Mais ou menos	Um pouco	De nenhum modo
13. A prática da SBE afeta positivamente minhas decisões clínicas.	6	5	4	3	2	1
14. A prática da SBE afeta positivamente os resultados em saúde da pessoa sob meus cuidados.	6	5	4	3	2	1

15. Novas evidências de pesquisa resultam em mudança na minha prática.	6	5	4	3	2	1
16. A prática da SBE propicia uma tomada de decisão compartilhada com a pessoa sob meus cuidados.	6	5	4	3	2	1
17. A prática da SBE aumenta a satisfação da pessoa sob meus cuidados.	6	5	4	3	2	1

Por favor, assinale a resposta mais apropriada:

	Correto	Incorreto	Não sei
18. Ensaios clínicos controlados, randomizados e os estudos observacionais são igualmente válidos na determinação da efetividade de um tratamento.			
19. Viés de publicação em uma metanálise representa viés de seleção.			
20. A randomização em um ensaio clínico ajuda a reduzir o tamanho amostral.			
21. Estudos transversais são os melhores delineamentos para avaliar fatores prognósticos.			
22. Um recente ensaio clínico randomizado descobriu que 29% dos diabéticos com doença coronariana tratados com pravastatina, apresentaram evento coronariano recorrente durante cinco anos de seguimento. Enquanto que, no grupo placebo, 37% sofreram eventos coronarianos recorrentes. A redução absoluta do risco para eventos recorrentes é 8%. A redução do risco relativo para eventos recorrentes é 22%. O número necessário para tratar para prevenir um evento recorrente é 12,5.			
23. O estudo recente HERS comparou mulheres que utilizam reposição hormonal com estrogênio versus mulheres que utilizaram placebo. Os resultados revelaram um risco relativo de eventos tromboembólicos de 2,89 para as mulheres que usaram estrogênio. Isso sugere que o tratamento com estrogênio representa risco coronariano. Para que esta diferença seja estatisticamente significante, deve-se verificar o intervalo de confiança. Um exemplo de intervalo de confiança que nos levaria a concluir que a taxa de eventos tromboembólicos venosos foi de fato (estatisticamente) diferente para estes dois grupos de tratamento seria algo que englobe 2,89 e inclui o 1,0 dentro do intervalo.			

24 **. Marque as opções que traduzem os seus desafios para implementar as práticas da SBE (selecione as três opções mais importantes)**

( ) Não existe cultura da prática da SBE em meu local de trabalho
( )Evidências insuficientes para muitos dos problemas de saúde cotidianos
( ) Falta de apoio institucional
( ) Falta de tempo
( ) Falta de acesso às fontes de informação

( ) Método complexo de aprender e de dominar
( ) Não tenho dificuldades para tomar decisões de acordo com os fundamentos propostos pela prática da SBE
( ) **Nenhuma das anteriores, pois não utilizo a prática da SBE.**

25 .**Na minha prática utilizo protocolos clínicos elaborados por (Selecione as opções possíveis):**
( ) Ministério da Saúde
( ) Sociedades Científicas Brasileiras
( ) *Guidelines* Internacionais (ex.: NICE)
( ) Pelo Hospital, Instituto ou local que trabalho
( ) Por mim mesmo, com base em leituras de estudos científicos e meu *background*
( ) Não utilizo protocolos na minha prática

26.Abaixo estão alguns termos relacionados com a apresentação dos resultados das investigações clínicas.

Marque o seu grau de familiaridade com os mesmos.	**Eu entendo e utilizo**	**Eu entendo mas não utilizo**	**Eu não entendo**
Revisão sistemática			
Metanálise			
Intervalo de confiança			
Grade			
Odds ratio, Risco relativo, Risco absoluto			
Número de pacientes necessários para tratar (NNT)			
Razão de verossimilhança (likelihood ratio)			

27. **Existem vários recursos disponíveis voltados para as práticas da SBE.**

Informe as plataformas que você já consultou.	**Não conheço**	**Conheço mas nunca utilizei**	**Conheço e utilizei apenas algumas vezes**	**Conheço e utilizo regularmente na minha prática**
Cochrane Library (ou Cochrane plus ou Biblioteca Cochrane)				
UptoDate				
Pubmed				
Trip Database				
Dynamed				

Scielo				
BMJ Best Practice				
NICE Clinical Guidelines				
Biblioteca Virtual em Saúde (BVS)				
Portal Saúde Baseada em Evidências do Ministério da Saúde				
Health Systems Evidence e Health Evidence				
Outro (especifique)_____				

28. Por favor, circule a resposta mais apropriada	**Concordo plenamente**	**Concordo**	**Concordo parcialmente**	**Neutro**	**Discordo parcialmente**	**Discordo**	**Discordo plenamente**
A instituição onde trabalho (nos casos de atuar em duas instituições, responda considerando aquela à qual dedica maior número de horas) implementa as práticas de SBE.	7	6	5	4	3	2	1

29.Eu passo atendendo pessoas, em média, _____ Horas/semana. ( ) Não atendo pessoas

30. Eu expendo, por semana, em média, na busca por evidências _____ horas /semana

Perfil Sócio-demográfico	
Profissão: ☐ Farmacêutico ☐ Médico ☐ Enfermeiro ☐ Dentista ☐ Fisioterapeuta ☐ Outro. Qual _____	
Sexo: ☐ Masculino ☐ Feminino	Data de nascimento:_____
Cidade onde vive/trabalha: _____/_____	
Eu utilizo alguma unidade de saúde pública para tratar meus problemas de saúde? ☐ Sim ☐ Não	
Ano de graduação: _____	
Instituição: _____	
Assinale seu maior nível de educação (complete a informação solicitada apenas no nível mais elevado):	

( ) Graduação ( ) Curso de especialização ( ) Mestrado ( ) Doutorado ( ) Pós-doutorado
Ano _____ Instituição:_____ Título do curso:_____
ATUALMENTE qual é o tipo de estabelecimento que você trabalha? *Explicação: LOCAL (o objetivo é identificar qual tipo de estabelecimento: drogaria, hospital, laboratório, universidade, serviço público (UBS, ambulatório, unidade especializada, pronto socorro), farmácia manipulação, consultório, indústria farmacêutica etc).*
Local 1: _____ Cargo: _____ Horas semanais: _____ Há quanto tempo você trabalha neste local? _____
Local 2: _____ Cargo: _____ Horas semanais: _____ Há quanto tempo você trabalha neste local? _____
Local 3: _____ Cargo: _____ Horas semanais: _____ Há quanto tempo você trabalha neste local? _____

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	Title page
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Not appicable
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*6,7 e 8*
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Not applicable
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	8
		(*b*) Describe any methods used to examine subgroups and interactions	Not applicable
		(*c*) Explain how missing data were addressed	Not applicable
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	8
		(*e*) Describe any sensitivity analyses	8
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Figure1 and page 10
		(b) Give reasons for non-participation at each stage	Figure1 and page 10
		(c) Consider use of a flow diagram	Figure1 and page 10
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Table 1 and page 10

		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	Table 2-5, page 9-11
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Table 2-5 page 9-11
		(*b*) Report category boundaries when continuous variables were categorized	Not applicable
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not applicable
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Not applicable
Discussion			
Key results	18	Summarise key results with reference to study objectives	11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11
Generalisability	21	Discuss the generalisability (external validity) of the study results	13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Not applicable

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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DESIGN AND VALIDITY OF AN INSTRUMENT TO ASSESS HEALTHCARE PROFESSIONALS' PERCEPTIONS, BEHAVIOR, SELF-EFFICACY AND ATTITUDES TOWARD EVIDENCE-BASED HEALTH PRACTICE. I-SABE

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SHORT TITLE: HEALTHCARE PROFESSIONALS' PERCEPTIONS, AND ATTITUDES TOWARD D EVIDENCE-BASED HEALTH PRACTICE

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ABSTRACT

Objectives: To develop and validate an instrument to measure Brazilian healthcare professionals' perceptions, behavior, self-efficacy, and attitudes towards EBP.

Design: Validation of an instrument using the Delphi method to ensure content validity and data from a cross-sectional survey to evaluate psychometric characteristics (psychometric sensitivity, factorial validity, and reliability).

Setting: National Register of Health Establishments database (CNES).

Participants: We included clinical health professionals who were working in the Brazilian public health system (Unified Health Care System – SUS).

Results: The Instrument to assess Evidence-Based Health (I-SABE) was constructed with five domains: Self-efficacy; Behavior; Attitude; Results/Benefits, and Knowledge/Skills. Content validity was done by 10-12 experts (three rounds). We applied I-SABE to 217 health professionals. Bartlett's sphericity test and the Kaiser-Meyer-Olkin (KMO) index were adequate ($\chi 2 = 1455.810$, $p < 0.001$; KMO = 0.847). Considering the factorial loads of the items and the convergence between the Scree Plot and the Kaiser criterion the four domains tested in this analysis, explaining 59.2% of the total variance. The internal consistency varied between the domains: Self-efficacy ($\alpha = 0.76$), Behavior ($\alpha = 0.30$), Attitudes ($\alpha = 0.644$), Results /Benefits to the patient ($\alpha = 0.835$).

Conclusions: The results of the psychometric analysis of the I-SABE confirm the good quality of this tool. The I-SABE can be used both in educational activities as well as an assessment tool among healthcare professionals in the Brazilian public health settings.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- The I-SABE was developed through a rigorous process, which involved the integration of evidence from the literature using a theoretical framework, a Delphi survey for the validity of the content, and psychometric assessments.
- The I-SABE can be used to measure EBP competencies of healthcare professionals, to identify barriers to and facilitators of EBP in clinical practice. In addition, the instrument can be used in educational activities, as well as an assessment tool among healthcare professionals across different settings in order to improve the implementation of evidence-based interventions.
- Web surveys with self-administered questionnaires are known to produce lower response rates compared to other data collection modalities.
- Although the response rate was 15%, this survey presented a good number of respondents from different types of healthcare professionals (physicians, nurses, and pharmacists) coming from diverse practice settings with different levels of experience, thus providing a good assessment of the overall knowledge and use of EBP in public health settings.
- The composite reliability was not performed in this research. It is suggested that it be verified using future studies to assess reliability with greater robustness, as well as confirmatory factor analysis, which makes it necessary to compose a larger sample of health professionals to administer the instrument.

INTRODUCTION

Evidence-based health practice (EBP) is identified as one of the most important factors for improving the results and sustainability of health systems and it has become an important competency for health professionals involved in patient care,[1]. EBP is defined as the integration of best research evidence with clinical expertise and patient values,[2]. There are several studies of improved patient outcomes following implementation of EPB such as reductions in length of hospital stay and costs, increased patient satisfaction, and the elimination of unnecessary or ineffective practices,[2].

Although the incorporation of scientific evidence as a basis for health decision-making is considered a critical factor to improve quality of care, the application of EPB is remains a major challenge,[3-5]. Studies showed competency gaps and low implementation rates among healthcare professionals across diverse practices and settings. Understanding of knowledge, skills, attitudes, and barriers related to EBP among healthcare professionals can help to elaborate effective and systematic strategies for integrating the EBP in healthcare services,[5].

Despite the availability of tools to assess EBP implementation among healthcare professionals, most of them have been developed to assess knowledge and skills and none is able to cover all domains established by the classification rubric for EBP instruments in education (the CREATE framework),[6-8]. According to a recent systematic review which includes 12 validated tools, few demonstrated multiple (≥ 3) types of established validity evidence, and none addressed domains such as self-efficacy, behaviors, or patient benefit,[9].

These limitations might compromise the ability to evaluate the impact of EBP implementation on health outcomes. The development of a validity instrument is important to determine gaps, to design interventions needed for integrating this competency in healthcare organizations, and to assess the effectiveness of future interventions in different contexts (e.g. hospitals, primary care services),[5].

In Latin America, despite increased efforts to disseminate and apply the EPB concepts, the application of EPB among healthcare professionals is still limited,[10-11]. There is lacking research to support the development of interventions to promote the EBP implementation in the clinical routine,[10-11]. In addition, no study developed a validity and reliability instrument to assess the gaps in EPB

implementation among healthcare professionals in the Brazilian context. Thus, this study aims to develop and validate an instrument for determining healthcare professionals' perceptions, behavior, self-efficacy, and attitude related to EBP in Brazil.

METHODS

The development was conducted in a systematic manner, using an accepted measure development methodology which included item development, content validity, pilot testing, and psychometric validation. The study was approved by the Ethics Committee (No. 1.425.808), and all participants gave written, informed consent before interviews or survey participation. Identifiable information, such as names, phone numbers, and addresses were not collected from participants in order to fully protect their privacy.

Development and validation of the instrument

Development of items

We draw on the EBP conceptual framework proposed by the "Rating Rubric for Assessment Tools for Evidence-Based Practice in Education" (CREATE) to guide the item development process,[12-14]. This framework is designed to help EBP educators and researchers identify the best assessment tool available and provide guidance for developers of new EBP assessment tools.

Candidate items were identified deductively, based on a literature review of items used in existing EBP tools with established validity evidence,[14-21]. Relevant and possible items were pooled by two researchers in five domains according to the CREATE structure attitudes, self-efficacy, knowledge/skills, behaviors, and results/benefits for patients). The definitions of domains used in this study are presented in Supplementary Appendix I.

The initial item pool was discussed and critically assessed by the research group before content validity testing and appropriate changes to the translation were made to ensure consistency. Items with similar content were excluded and new items were generated if there is no existing instrument. After this stage, we use the consensus approach to ensure the content validity of a tool of 31 items. For each item, the consensus was

reached if at least 80% of the participants' votes belong to the same category (1–3, 4–6, or 7–9).

Content Validity

Content validity refers to the degree to which elements of the instrument are relevant to and representative of the targeted construct for a particular assessment purpose, [22]. This could be done using the results of several examiners' analyses (panel of experts) who verify the items' representation regarding content areas and the relevance of the objectives to be measured. We used a panel of experts through a consensus technique, according to simplified Delphi's method, [23].

The Delphi method is a structured process distributing rounds of the questionnaire in analysis to gather information and set priorities or gain consensus regarding a specific issue. This method is characterized by anonymity, iteration, controlled feedback, and stability in responses among those with expertise on a specific issue,[24-25]. The Delphi technique was conducted in online web surveys where the panel of experts filled out the form given their responses directly and blinded from others,[25].

Selection of experts

The panelists were identified through an advanced search system of the Lattes platform on the National Council for Scientific and Technological Development (CNPq) website, using the following keywords: evidence-based health, evidence-based health practices, evidence-based medicine, questionnaire, measurement instruments, questionnaire validation, and psychometric analysis.

The following criteria were used for selecting a panel of experts: publication of at least three scientific articles on EBP practices or projects/articles that involved validation of questionnaires in the health area published in the last four years, or professional practice with experience in EPB. We identified 25 potential participants who were then invited by email. Each potential panelist was informed about the voluntary nature of the study and was provided with full study information, outlining the aim of the study, the extent, and the timing of their expected involvement.

Rounds

We planned at least three rounds. During the rounds, the panel board members were invited to comment on grammar and phrasing to improve uniform interpretation of items and prevent socially desirable responses, if they suggest additional items or dimensions. The content assessment was done considering Theoretical Dimension, Theoretical Relevance, Clarity, and Relevance or representativeness as it was explained in our protocol, [26]. For each item in the questionnaire, we used the traditional 4-point Likert scale that ranged from one point (completely disagree) to four points (completely agree). Following each item, a space was included for panelists to write their suggestions for improving the item or making comments. If the expert marked the answer I completely disagree with or disagree with, he must justify his answer. The experts were also offered the opportunity to add items. Doubts about comments or suggestions were resolved with the experts by telephone or email. To avoid imposing our views on participants, the researchers only contacted panelists if there was some doubt about their suggestions in order to avoid possible mistakes related to elaboration of items. After each round, the results and comments were analyzed and summarized by the research team in order to guide the instrument revision. The modified instrument was again sent to the panelist group for the next round of analysis. Each round lasted 30 days corresponding to 15 days for the panelists' answers and another 15 days for the researchers' analysis

Descriptive analyses

After each round, data generated from completing the online questionnaire were extracted to Microsoft Excel for descriptive analysis (frequencies and percentages) to determine the percentage rating of agreement or disagreement among experts.

Determining consensus

We used the traditional 9-point scale (1=extremely irrelevant to 9=extremely relevant) to assess each item. The participants' responses were categorized as irrelevant (1–3), equivocal (4–6), and relevant (7–9). For each item, the consensus was reached if at least 80% of the participants' votes belong to the same category (1–3, 4–6, or 7–9), [27-28]. Items that do not reach a consensus will be reviewed and submitted for the next round. During the Delphi process, only one panelist suggested significant changes in the instrument. The items were revised and returned to the vote in the next round.

Criteria for dropping items at each round

If 80% or more of the participants' votes completely disagree or disagreed, the item was excluded from the instrument. After the end of content validation, this stage was complemented with exploratory factor analysis.

Feedback

Quantitative (percentage rating) and qualitative feedback from each round of the Delphi process were incorporated into the survey for the next round. The expert panel was instructed to consider the feedback.

Anonymity

The anonymity among panelists was ensured during the Delphi process. Thus, the participants did not know who was participating in the panel. Anonymity can be assured as the entire was traditionally handled via remote dispersed geographic participation that was coordinated by the researcher(s),[29].

Pilot Study

In order to identify possible doubts regarding the understanding of the items, panelists were asked to indicate health professionals to answer the instrument. Each panelist appointed three health professionals, totaling 36 potential participants. Of these, 28 agreed to participate in the research. If any of the nominated professionals were a panelist during the content validation, this professional was not included in the pilot study. Therefore, the researchers asked to panelist appoint another possible participant.

Evaluation of Psychometric Characteristics

Study design: this step is a cross-sectional study.

Setting

We gathered the survey participants from the National Register of Health Establishments database (CNES), which hosts free access to data from all public health institutions of Brazil. Queries on CNES can be performed at http://cnes.datasus.gov.br/ filtering by geographic location (i.e. State and Municipality), and type of

establishment. It also provides the name, role, workload, and employment contract of each healthcare professional. We selected only medical professionals, nurses, dentists, and pharmacists who are working in Brazil's public health sector (Unified Health Care System - SUS).

Participants

We included clinical health professionals who are currently working in the public health system and excluded professionals on leave from work for limited or unlimited time during the period of application of the questionnaire, or retired professionals.

Study size

The estimated minimum sample size was based on the requirement of 5-10 subjects per model parameter, [30]. In 2016, government database registered 240,750 physicians; 182,861 nurses, 58,421 dentists, and 20,593 pharmacists. Thus, we choose to work with a representative sample bigger than that recommended for the statistical analysis. Considering a 30% response rate, we estimate a sample size of 1,270 respondents needed to answer one of our questions (percentage of prior contact, familiarity with EBP), with 5% precision. To obtain this precision we dichotomized the first item of the survey (being favorable or not to EBP) assuming maximum variability (50% of responses favorable to EBP). A confidence interval of 95% was applied to the percentage of favorable responses.

Randon Sampling

The random sample was performed with the Microsoft Excel® software in a central computer considering some stratifications (e.g. type of professional, geography, settings, etc). We recruited potential participants through email with an invitation letter containing a link to the web survey. Professionals without e-mail addresses available in CNES were be contacted by phone or fax at their workplace and will be sent a physical survey by postal mail to their work addresses.

Data collected

After health professionals agreed to participate in the study, the instrument I-SABE was sent *online* through the *survey monkey* platform (https://pt.surveymonkey.com/).

Data Analysis

Data analyses were performed using SPSS (V.20.0) and Stata (V.12.0).

Psychometric sensitivity

The summary and shape measures of the questionnaire items distribution were used to estimate their psychometric sensitivity. Items with a skewness (Sk) greater than 3 and kurtosis (Ku) greater than 7 in absolute values are considered to have psychometric sensitivity issues, [30]. The diagnosis of multivariate outliers is to be performed by computing the Mahalanobis distance, [30].

Factorial validity

The Exploratory factor analyses (EFAs) were directed to the following domains: Self-efficacy, Behavior, Attitudes, and Results/Benefits. Therefore, only 20 items were included in this analysis. All items from domain Knowledge/Skills and item 21 from the domain attitude were not included since they are not measuring latent variables.

EFAs were conducted by using Principal Axis Factoring in order to partition systematic and error variance in the solution,[31, 32]. Promax oblique rotation was be used, allowing for factor inter-correlations. To promote simple structure, items were retained on a factor if they load at least 0.30 on the primary factor and less than 0.30 on all other factors,[31].

Reliability

The reliability of an instrument used for data collection is its coherence, determined by the constancy of the results. A reliable (stable) measure is consistent and precise because it provides a constant measurement of the variable,[33]. To estimate the reliability, both the internal consistency and stability were evaluated.

We explored internal consistency, that is, the reliability estimated from the internal consistency, by using standardized alpha Cronbach coefficient (α), where Cronbach α of 0.7 to 0.8 is considered satisfactory, 0.8 to 0.9 is good, and 0.9 is excellent,[34].

Patient and public involvement

No patient was involved.

RESULTS

Development and validation of the instrument

The results of the development and validation of the instrument are described in figure 1.

Development of items

Considering the theoretical framework adopted and the guidelines of the CREATE methodology, initially we developed a preliminary instrument containing 31 items across five domains: Self-efficacy, Behavior, Attitudes, Results/Benefits to the patient, and Knowledge/Skills, Supplementary Appendix 1. The instrument was named I-SABE (Instrument to assess Evidence-Based Health)

Content Validity

Three rounds of expert panels were carried out to assess the preliminary instrument. Of the 15 potential experts selected, 12 (80%) agreed to participate in the study. The second and third rounds of instrument evaluation had the participation of 10 (66.7%) experts. The majority of respondents completed the questionnaire between 15 to 20 minutes.

In the first round, the experts identified items that were not clear. This process resulted in the exclusion and convergence of items according to the consensus adopted. Thus, four items out of 31 instrument items were removed, resulting in 27 remaining items (item 6 was incorporated in the item 2, items 7, 13, and 14 were excluded).

Some experts highlighted the need to include new items, for example, in the "Attitude" domain, the following items were included: "The practice of EBP increases the satisfaction of the person in my care" and "The practice of EPB provides an outlet of decision shared with the person in my care" (item 32 and 33 were added).

In the second round, a consensus was reached for 100% of the domains selected. However, experts emphasized the importance of characterizing the health professional's practice, suggesting the inclusion of items that reflect clinical practice. Thus, after the second round, four items were included, resulting in a total of 31 items. These items, item 21 from the Attitude domain and all items from the Knowledge/Skill

domain were not included in the analysis stage of psychometric characteristics, as these questions are not measuring latent variables.

In the third round, experts reached a consensus on the four items suggested in the previous round. At the end of the content validity, the instrument I-SABE was finalized with 31 items across five domains. All changes, inclusion, and exclusion of the items are described in Supplementary Appendix 2.

Pilot study

After determining the content validity, the instrument was applied to a sample of 28 health professionals which included physicians, nurses, and pharmacists. Based on responses from health professionals, we modified item 19 "Time is a factor that favors my use of EBP". This item was considered incomprehensible item. The item was reevaluated with members of the expert committee and changed to "I don't use EBP because I don't have time". At the end of this stage, 77.7% of the participants reported not feeling any difficulty in filling out the I-SABE instrument and the average completion time was 12 minutes.

These modifications were included in the new version of I-SABE included which was submitted to the assessment of validity and reliability. The time of each participant took to complete the questionnaire varied between 24 and 66 minutes. The mean time that participants took to complete the questionnaire was 12 minutes. The perceived length of the same was deemed appropriate for most participants (88%). The mean perceived difficulty of the questionnaire was 2 (0 = very easy; 10 = very difficult).

Development of Psychometric Characteristics

Participants

Of the 2,550 health professionals listed, 1,380 subjects were recruited from a random sampling. At the end of this stage, the response rate was 15%, Figure 2.

The demographic and academic characteristics of 217 Brazilian health professionals who participated in the study were summarized in Table 1. The majority of sample were women (n=148; 69.5%), pharmacist (n=84; 38.7%), have specialization degree (n=90; 41.5%), and work in primary care (n=70; 32.3%). Detailed characteristics of survey respondents are presented in table 1.

Psychometric sensitivity

Skewness and Kurtosis are within the commonly agreed-upon thresholds of lower than 1 for skewness and lower than 3 for kurtosis, indicating a normal distribution of the I-SABE, and, therefore, an adequate psychometric sensitivity, Table 2.

Factorial validity

The sample suitability indices presented good conditions for the factorial analysis: Kaiser-Meyer-Olkin (KMO) of 0.847 and Bartlett's sphericity with $p < 0.001$, Table 3. Visual inspection of the scree plot (Figure 3) revealed that the point of inflexion in the plot occurred at the fifth factor, indicating that four factors should be retained.

Varimax orthogonal rotation allowed a more precise classification of each of the factors (domains), Table 4.

The analysis revealed four factors whose eigenvalues were > 1, accounting for 52.6% of the total variance in the measure. After the completion of this step, Item12 was removed because it presented a confounding factor and with a factor load below 0.4. The final instrument is described in Supplementary Appendix 3 (Portuguese version) and Supplementary Appendix 4 (English version).

Reliability

The reliability of the I-SABE instrument was assessed by Cronbach's alpha, the values were calculated for each factor, as described in Table 5.

DISCUSSION

The robustness of the results of a study depends on the quality and validity of the instrument used. This study presented the development and the initial validation process of an instrument (I-SABE) to verify different aspects of EPB, using a rigorous methodology. Our findings demonstrated that the I-SABE has an overall good level of psychometric properties measured as content and factorial validity, internal consistency reliability in order to measure the four domains of EBP among the different types of health professionals (mainly pharmacists, physicians, and nurses), indicating that this instrument is an efficient and effective instrument for use in research and public health settings.

Although several tools combine more than one domain of EBP assessment in a single instrument, these predominantly focus on certain domains (i.e., knowledge and skills) and EBP steps (i.e. appraise), [6, 9, 35-37]. To our knowledge, I-SABE is the first tool that has addressed the following five domains in a single instrument: 1-Self-efficacy; 2- Behavior; 3-Attitude; 4-Results/Benefits and 5-Knowledge/Skills, [6,9].

The I-SABE was designed to evaluate EBP implementation among healthcare professionals with different levels of experience in Brazilian Public Health. Two instruments that assess EBP competencies have been culturally adapted and validated in Brazil, [38-39]. However, these instruments were developed to assess EPB in specific populations such as medical students and nurses. Furthermore, in the literature, few validation studies were developed with a multidisciplinary sample, [40]. However, for EBP to be fully implemented, it is essential to clarify possible differences among healthcare professionals since the EBP is a shared competency.

Regarding the five domains evaluated, the “self-efficacy" domain had a high factor load for the items and demonstrated a good correlation with the items, suggesting an adequate construction that allows measuring the self-efficacy of health professionals in the use of EBP. The domain "results/benefits for the patient" accurately also reflects the content of the item and the direction of the I-SABE. This domain is considered an important aspect of EBP since it focuses on the impact of EBP on practice and results,[13].

The internal consistency of I-SABE was assessed by Cronbach’s alpha. Some authors recommend that Cronbach’s alpha value must be at least between 0.60 and 0.70 to have a reliable instrument, [41-42]. Based on this evidence, it can be observed that Self-efficacy, Results /Benefits to the patient, and Attitude domains show adequate internal consistency.

On the other hand, we observed a lower internal consistency of the “behavior” domain. Low internal consistency suggested that the items within the construct of “behavior” were low correlated. A possible explanation might be the low number of items (n = 3) in this domain. Cronbach's alpha values are quite sensitive to the number of items in the scale, and with short scales (< 10 items) it is common to find quite low Cronbach's alpha values.

This limitation is in agreement with the findings reported for other studies. For instance, in the validation study of the ACE scale (Assessing medical trainees' competency in evidence-based medicine), the authors identified a low internal consistency to questions about a critical appraisal, with specific reference to selection

and performance bias,[43]. Findings from the evidence-based practice scale (EBP-KABQ) also observed lower internal consistency of the "knowledge" domain compared to other items, suggesting that the six items within this construct were not adequately correlated,[44].

Finally, Although the "Knowledge and Skill" domain was not included in the analysis stage of psychometric characteristics since these questions are not measuring latent variables. The I-SABE considered the requirements from the CREATE framework, examining user knowledge and skills across steps 1–4 of the EBP process,[13].

Strengths and Limitations

This study was developed through a rigorous process, which involved the integration of evidence from the literature using a theoretical framework, a Delphi survey for the validity of the content, and psychometric assessments. As a strength, we use the CREATE taxonomy as a framework to elaborate and the instrument,[13]. This framework has been developed by a specialist group and describes seven areas of evaluation of EBP educational interventions, out of which five were used as a framework for the I-SABE. Secondly, the content of the instrument was based on a literature review and was validated by a panel of experts, and was pretested, which strengthened its validity. Thirdly, we performed a simple random sampling of Brazilian healthcare professionals to select the participants of the study. Although the sample was relatively low when compared to the total number of professionals previously selected, the number of 217 healthcare professionals was sufficient to perform factors analysis since sample size calculation was based on a participant to item ratio of 5:1,[30].

However, there are some limitations to be considered. Web surveys are known to produce lower response rates compared to other data collection modalities,[45]. Although the response rate was 15%, this survey presented a good number of respondents from different types of healthcare professionals (physicians, nurses, and pharmacists) coming from diverse practice settings with different levels of experience, thus providing a better idea of the overall knowledge and use of EBP in public health settings than many previous studies, frequently focused on a specific profession and a particular setting. Additionally, we had a higher proportion of pharmacists (38.7%) compared with other healthcare professionals (30.8% physicians: 17.1% nurses and 13.4% other healthcare professionals). It is important to note that we only included

clinical pharmacists who work with healthcare teams in patient care and who was involved in the selection of intervention or medication for patients. Pharmacists have a crucial role in the health system to maintain the rational use of medicine and provide pharmaceutical care to patients,[46]. EBP is an essential approach to promote the rational use of medications, making sure that patients receive the right medicine in the right dose for the right diagnosis at the right time at the lowest possible cost suitable to their requirements,[46]. Finally. the composite reliability was not performed in this research. It is suggested that it be verified using future studies to assess reliability with greater robustness, as well as confirmatory factor analysis, which makes it necessary to compose a larger sample of health professionals to administer the instrument.

Implications for clinical practice and future research

The I-SABE was found to be a valid and reliable instrument to assess self-efficacy, behavior, attitude, and results/benefits toward EPB in Brazil. This tool can be used to measure the EBP competencies of healthcare professionals in Brazil and to identify barriers to and facilitators of EBP in clinical practice in order to improve the implementation of this practice. In addition, the instrument can be used in educational activities, as well as an assessment tool among healthcare professionals in different public healthcare settings.

Conclusion

The I-SABE is a valid and reliable instrument to assess the EBP among healthcare professionals. The application of this instrument is simple, quick, and provides a reliable assessment of the EBP in the main stages of the execution of the EBP in order to favor their implementation. Future research is required to further examine other psychometric properties of I-SABE and its utility in patient care.

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2.

Table 1- Demographic, academic, and setting of work characteristics of participants.

Characteristics	N=217 (%)
Sex	
Female	148 (72.7)
Male	69 (30.8)
Profession	
Physician	67 (30.8)
Pharmacist	84 (38.7)
Nurse	37 (17.1)
Dentist	4 (1.8)
Physiotherapist	10 (4.6)
Others	15 (6.9)
Time since graduation	
< 10 years	95 (43.8)
11-20 years	88 (40.5)
> 20 years	34 (15.7)
Education/ Highest professional degree	
Post-doctoral	14 (6.3)
Doctorate	23 (10.4)
Master's degree	57 (25.8)
Specialization degree	90 (41.5)
Graduate degree	33 (14.9)
Setting of work	
Primary care	70 (32.3)
Hospital	54 (24.9)
Outpatient clinic	35 (16.1)
University	43 (19.8)
Others	15 (6.9)

Table 2- Summary and shape measures of instrument I-SABE

Items	Mean	Median	Standard deviation	Skewness	Kurtosis
1	1.98	2.00	1.02	1.30	2.95
2	2.18	2.00	1.22	1.43	2.17
3	2.35	2.00	1.06	0.80	0.76
5	2.49	2.00	1.06	0.83	0.75
8	1.61	1.00	0.83	1.49	2.37
9	2.10	2.00	1.06	0.96	0.67
10	2.55	2.00	1.44	1.29	1.37
11	3.10	3.00	1.69	0.66	-0.62
12	4.25	4.00	1.48	0.12	-1.09
15	5.20	6.00	1.45	-0.43	-0.99
16	5.30	6.00	1.42	-0.76	-0.13
17	2.10	2.00	1.05	1.21	2.88
18	3.05	3.00	1.37	0.73	0.13
19	5.05	5.00	1.59	-0.06	-0.56
20	6.04	6.00	1.14	-1.69	3.65
22	2.26	2.00	1.11	1.15	1.77
23	2.22	2.00	0.96	0.91	1.44
24	2.36	2.00	1.00	0.92	1.38
32	2.48	2.00	1.12	0.86	0.69
33	2.69	3.00	1.14	0.66	0.39

Table 3 - Value of Kaiser-Meyer- Olkin and Bartlett's Tests

Tests		Results
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.847
Bartlett's Test of Sphericity	Approx. Chi-Square	1455.810
	Df	210
	Sig.	0.000

Table 4- Factor structure matrix with orthogonal varimax rotation of instrument I-SABE.

Item	Factorial analysis			
	1	2	3	4
1.I am able to incorporate evidence from scientific literature into my practice.	0.171	**0.611**	-0.183	0.359
2. I am able to access the best evidence of scientific literature in the time I need them.	-0.021	**0.773**	-0.155	-0.063
3. I am able to critically evaluate the evidence from the scientific literature.	0.133	**0.762**	-0.120	-0.050
5. I am able to keep up to date with the evidence	0.177	**0.778**	0.029	0.029
8. I am sure that the implementation of Evidence-Based Health (EBP) improves my clinical or professional practice.	**0.623**	0.039	-0.179	0.094
9. I use evidence from research to support my clinical decisions	0.410	0.303	0-.224	**0.539**
10. I ask colleagues for help in consulting the scientific literature to find answers to my clinical questions.	0.015	0.059	0.068	**0.641**
11. When the research evidence doesn't support my reliable clinical routines, I feel uncomfortable.	-0.092	-0.034	0.062	**0.650**
12. I prefer to use my experience to make clinical decisions	**0.373**	-0.063	**0.369**	**0.370**
15. I adopt the EBP practice because my colleagues do it.	0.104	0.007	**0.631**	0.265
16. It is difficult to change my practice to use EBP	-0.375	-0.375	**0.582**	0.078
17. EBP makes me feel confident in my clinical decisions.	**0.668**	0.048	-0.206	0.116
18. I feel that EBP considers my clinical or professional experience.	**0.538**	0.321	0.204	0.109
19. I don't use EBP because I don't have time	0.023	-0.399	**0.633**	-0.021

20. I feel that EBP worsens the quality of my clinical decisions.	-0.325	-0.085	**0.582**	-0.019
22. EBP positively affects my clinical decisions.	**0.667**	0.070	-0.466	0.094
23. EBP positively affects the health results of the person under my care.	**0.701**	0.048	-0.323	0.032
24. New research evidence results in a change in my practice.	**0.609**	0.042	-0.222	0.149
32. EBP provides a decision-making shared with the person under my care.	**0.725**	0.160	0.101	-0.101
33. EBP increases the satisfaction of the person under my care.	**0.754**	0.121	-0.021	-0.152
Values	**5.838**	**2.110**	**1.847**	**1.242**
Explained Variance	**27.801**	**10.048**	**8.795**	**5.913**

*I-SABE: Instrument to assess evidence-based heal

Table 5 - Cronbach's alpha values for each factor (domain)

Factor	*Cronbach's Alpha*	*Cronbach's Alpha Based on Standardized Items*	Number of Items
Self-efficacy	0,762	0,764	4
Behavior	0,302	0,322	3
Attitudes	0,644	0,650	4
Results	0,835	0,840	5

Figure 1. Results of development and validation of the instrument

Figure 2. Flowchart of sample composition

Figure 3. Scree plot graphic

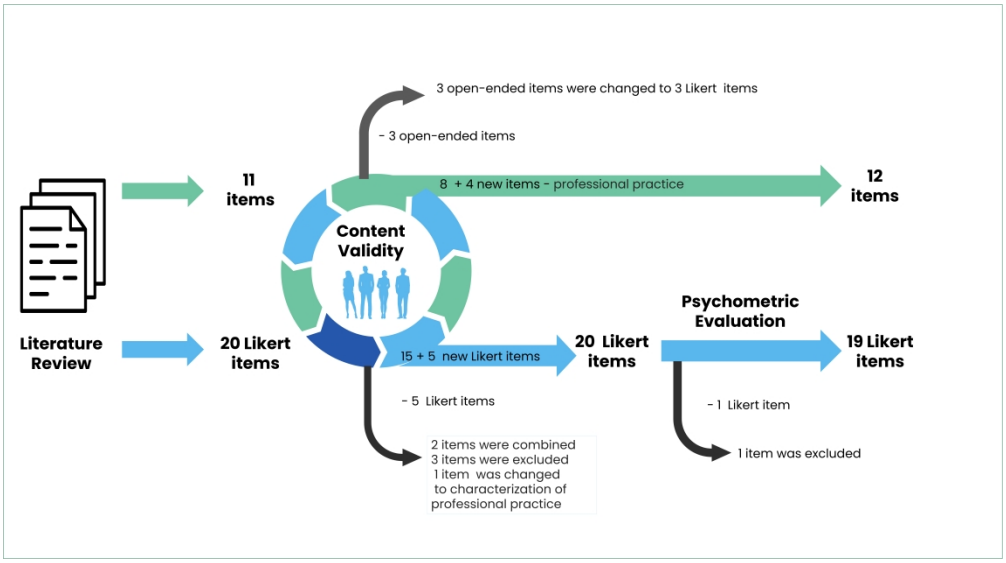

Figure 1. Results of development and validation of the instrument

685x381mm (300 x 300 DPI)

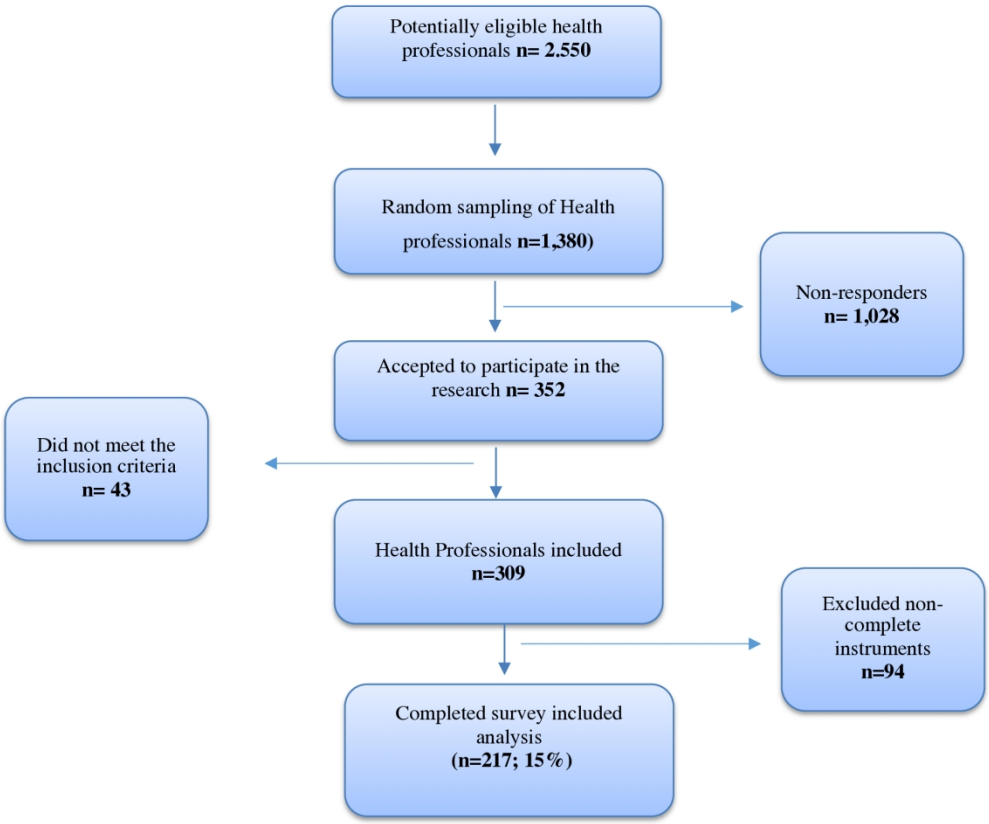

Figure 2. Flowchart of sample composition

170x140mm (300 x 300 DPI)

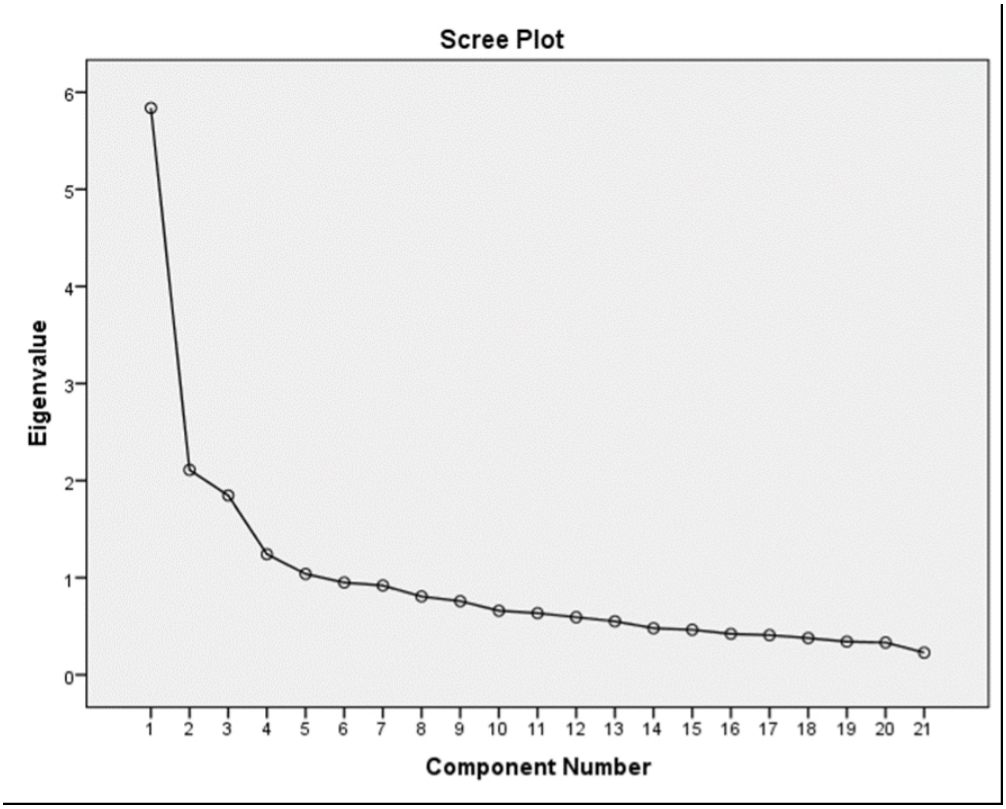

Figure 3. Scree plot graphic

143x115mm (157 x 157 DPI)

APPENDIX 1 - Definition of domains in SBE practices.

Domain	Definition
Self-efficacy	It refers to people's judgments regarding their ability to perform a certain activity (BANDURA, 1977). For example, an individual's confidence in his or her ability to search for evidence may be related to his or her efforts to search for scientific evidence (SALBACH et al., 2009).
Knowledge	It is attributed to the concepts about SBE. Knowledge assessments can measure an individual's ability to define SBE concepts, list basic EBP principles or characterize levels of scientific evidence. Thus, knowledge assessment questions can ask health professionals to define the "Number Needed to Treat" or identify the "type of study" most appropriate to answer a given clinical question (TILSON et al., 2011).
Behavior	It refers to the individual's real performance in his practice. As for example, the professional changes his service after analyzing a synthesis of evidence (TILSON et al., 2011)
Attitudes	Attitudes are strong indicators of future behavior (AJZEN, 1991) There is evidence that individuals' confidence in the benefits of evidence-based practices are related to the degree that they implement the practice of EBP in their work (MEINYK et al., 2017).
Results / Benefits to the patient	The goal of EBP is to improve health care outcomes for patients. Therefore, it is essential to assess the impact of EBP on the benefit of patients (STRAUS et al., 2004) (NABULSI et al., 2007).
Skills	Skills refer to the application of knowledge, ideally in a practical environment (FREETH et al., 2006) Skill assessment would require clinicians to "do" a task associated with EBP, such as conducting research, use a critical assessment tool to summarize the quality of the study, for example, or

	calculating the number needed to treat (TILSON et al., 2011).

APPENDIX 2 - Changes to the items that make up the I-SABE, during content validation.

I-SABE preliminary	I-SABE after content validity
Self-efficacy	
1- I am confident in my ability to adopt evidence-based health practice.	1- I am able to incorporate evidence from the scientific literature into my practice.
2- I feel able to find the best available evidence	2- I am able to access the best evidence from the scientific literature, in the time I need them.
3- I feel that I am able to critically assess the evidence coming from my search of the scientific literature.	3- I am able to critically assess evidence from the scientific literature.
4- I feel I am able to apply the evidence from the research to the care of individual patients.	**This item was excluded.**
5- I feel able to keep up with the evidence.	5- I am able to keep up to date with the evidence.
6- I feel able to access (search and find) the best clinical evidence at the time I need it	**This item was Incorporated in the item 2.**
7- I am unsure about how to measure the results of my own clinical practice.	**This item was excluded.**
8- I am sure that implementing Evidence Based Health (SBE) improves my clinical or professional practice.	8- I am sure that implementing Evidence Based Health improves my clinical or professional practice.
Attitude	
9- I often use research evidence to support my clinical decisions.	9- I use research evidence to support my clinical decisions
10- I ask colleagues for help in searching the scientific literature to find answers to my clinical questions.	10- I ask colleagues for help in consulting the scientific literature to find answers to my clinical questions.
11- When the research evidence does not support my reliable clinical routines, I feel uncomfortable.	11- I feel uncomfortable when research evidence does not support my clinical or professional practices.
12- I prefer to use my own experience to make my clinical decisions.	12- I prefer to use my own experience to make my clinical decisions.
13- I rarely look for available research evidence to answer my daily clinical question.	**This item was excluded.**
14- I frequently, at least twice a week, access evidence provided by Cochrane	**This item was excluded.**
Behavior	
15- I use the EBP because my peers do.	15- I adopt the EBP because my peers do.

16- I don't use EBP because it's hard to change my practice.	16- It is difficult to change my practice to use EBP.
17- EBP makes me feel autonomous in my clinical decisions	17-EBP makes me feel confident in my clinical decisions
18- I feel that SBE disregards my clinical experience.	18- I feel that EBP considers my clinical or professional experience.
19- I don't use EBP because I don't have time.	19- I don't use EBP because I don't have time.
20- I feel that EBP worsens the quality of my clinical decisions.	20- I feel that EBP worsens the quality of my clinical decisions.
21- I do not use EBP in my clinical practice for another reason (please specify).	21- I do not use EBP in my clinical practice for another reason (please specify).
Results/Benefits to the patient	
22- How much has the use of the **EBP** affected patient outcomes?	22- The EBP positively affects the health outcomes of the patient under my care.
23- How much has the use of the **EBP** practice affected your clinical decisions?	23 - The EBP positively affects my clinical decisions
24- How often does new research evidence result in a change in your practice?	24 - New research evidence results in change in my practice.
25- The institution where I work (in cases of working in two institutions, answer considering the one that devotes the most hours) has already implemented EBP.	**This item has been changed to characterization of professional practice.**
	32.The EBP provides a shared decision-making with the person under my care
	33. The EBP increases the satisfaction of the person under my care.
Knowledge/Skills	
26**-** Clinical trials and observational methods are equally valid in establishing the effectiveness of a treatment.	26- Randomized controlled trials and observational studies are equally valid in determining the effectiveness of a treatment.
27- Publication bias (Funel plot) in a meta-analysis represents selection bias	27-Publication bias in a meta-analysis represents selection bias.
28- Randomization in a clinical trial helps to reduce sample size.	28- Randomization in a clinical trial helps to reduce sample size.
29- Cross-sectional studies are the best designs to assess prognostic factors.	29- Cross-sectional studies are the best designs to assess prognostic factors.
30- A recent randomized clinical trial found that 29% of diabetics with coronary heart disease treated with	30- A recent randomized clinical trial found that 29% of diabetics with coronary heart

pravastatin had a recurrent coronary event during five years of follow-up. Whereas, in the placebo group, 37% suffered recurrent coronary events. The absolute risk reduction for recurrent events is 8%. The relative risk reduction for recurrent events is 22%. The number needed to treat to prevent a recurrent event is 12.5.	disease treated with pravastatin had a recurrent coronary event during five years of follow-up. Whereas, in the placebo group, 37% suffered recurrent coronary events. The absolute risk reduction for recurrent events is 8%. The relative risk reduction for recurrent events is 22%. The number needed to treat to prevent a recurrent event is 12.5.
31- The recent HERS study compared women using estrogen replacement hormone versus women using a placebo. The results revealed a relative risk of thromboembolic events of 2.89 for women who used estrogen. This suggests that estrogen treatment poses a coronary risk. For this difference to be statistically significant, the confidence interval must be checked. An example of a confidence interval that would lead us to conclude that the rate of venous thromboembolic events was indeed (statistically) different for these two treatment groups would be something that encompasses 2.89 and includes the 1.0 within the interval.	31- The recent HERS study compared women using estrogen replacement hormone versus women using a placebo. The results revealed a relative risk of thromboembolic events of 2.89 for women who used estrogen. This suggests that estrogen treatment poses a coronary risk. For this difference to be statistically significant, the confidence interval must be checked. An example of a confidence interval that would lead us to conclude that the rate of venous thromboembolic events was indeed (statistically) different for these two treatment groups would be something that encompasses 2.89 and includes the 1.0 within the interval.
Characterization of professional practice	
	25- The institution where I work (in cases of working in two institutions, answer considering the one that devotes the most hours) has already implemented EBP.
	34- Check the options that reflect your challenges to implement SBE practices (select the three most important options) ( ) There is no culture of SBE practice in my workplace ( ) Insufficient evidence for many everyday health problems ( ) Lack of institutional support ( ) Lack of time ( ) Lack of access to information source

	35.In my practice I use clinical protocols developed by (Select the possible options): ( ) Ministry of Health ( ) Brazilian Scientific Societies ( ) International Guidelines (eg: NICE) ( ) By the Hospital, Institute or place where I work ( ) By myself, based on readings from scientific studies and my background ( ) I do not use protocols in my practice
	36- Below are some terms related to the presentation of the results of clinical investigations. Please, check your degree of familiarity with the following terms:
	37- There are several platforms available aimed at EBP. Please, check your degree of familiarity with the following platforms:

APPENDIX 3 - FINAL INSTRUMENT - PORTUGUESE VERSION

I-SABE

Autoconfiança

Por favor, circule a resposta mais apropriada:	Concordo plenamente	Concordo	Concordo parcialmente	Neutro	Discordo parcialmente	Discordo	Discordo plenamente
1. Eu sou capaz de incorporar na minha prática a evidência proveniente da literatura científica.	7	6	5	4	3	2	1
2. Eu sou capaz de acessar (buscar em bases eletrônicas, usando estratégias de busca e encontrar) as melhores evidências da literatura científica, no tempo que necessito delas.	7	6	5	4	3	2	1
3. Eu sou capaz de avaliar criticamente a evidência proveniente da literatura científica.	7	6	5	4	3	2	1
4. Eu sou capaz de manter-me atualizado em relação às evidências.	7	6	5	4	3	2	1
5. Estou certo de que a implementação da Saúde Baseada em Evidência (SBE) melhora minha prática clínica ou profissional	7	6	5	4	3	2	1

Atitudes

Por favor, circule a resposta mais apropriada	Concordo plenamente	Concordo	Concordo parcialmente	Neutro	Discordo parcialmente	Discordo	Discordo plenamente
6. Eu uso as evidências provenientes de pesquisa para apoiar as minhas decisões clínicas.	7	6	5	4	3	2	1
7. Eu peço ajuda aos colegas na consulta à literatura científica para encontrar respostas às minhas perguntas clínicas.	7	6	5	4	3	2	1
8. Eu me sinto desconfortável quando as evidências de pesquisa não sustentam minhas práticas clínicas ou profissionais.	7	6	5	4	3	2	1

Comportamento

Por favor, circule a resposta mais apropriada: atitude	Concordo plenamente	Concordo	Concordo parcialmente	Neutro	Discordo parcialmente	Discordo	Discordo plenamente
9. Eu adoto a prática da SBE porque meus colegas o fazem.	7	6	5	4	3	2	1
10. É difícil mudar a minha prática para usar a SBE	7	6	5	4	3	2	1
11. A SBE me faz sentir confiante em minhas decisões clínicas	7	6	5	4	3	2	1
12. Eu não uso SBE porque eu não tenho tempo	7	6	5	4	3	2	1
13. Eu sinto que a SBE piora a qualidade das minhas decisões clínicas.	7	6	5	4	3	2	1
14. Eu sinto que a SBE considera minha experiência clínica ou profissional.	7	6	5	4	3	2	1
15. Eu não adoto a prática da SBE por outra razão (especifique):							

Resultados/Benefícios para o paciente

Por favor, circule a resposta mais apropriada:	Completamente	Muito	Moderadamente	Mais ou menos	Um pouco	De nenhum modo
16. A prática da SBE afeta positivamente minhas decisões clínicas.	6	5	4	3	2	1
17. A prática da SBE afeta positivamente os resultados em saúde da pessoa sob meus cuidados.	6	5	4	3	2	1
18. Novas evidências de pesquisa resultam em mudança na minha prática.	6	5	4	3	2	1
19. A prática da SBE propicia uma tomada de decisão compartilhada com a pessoa sob meus cuidados.	6	5	4	3	2	1
20. A prática da SBE aumenta a satisfação da pessoa sob meus cuidados.	6	5	4	3	2	1

Conhecimento/Habilidades

Por favor, assinale a resposta mais apropriada:	Correto	Incorreto	Não sei
21. Ensaios clínicos controlados, randomizados e os estudos observacionais são igualmente válidos na determinação da efetividade de um tratamento.			
22. Viés de publicação em uma metanálise representa viés de seleção.			
23. A randomização em um ensaio clínico ajuda a reduzir o tamanho amostral.			
24. Estudos transversais são os melhores delineamentos para avaliar fatores prognósticos.			
25. Um recente ensaio clínico randomizado descobriu que 29% dos diabéticos com doença coronariana tratados com pravastatina, apresentaram evento coronariano recorrente durante cinco anos de seguimento. Enquanto que, no grupo placebo, 37% sofreram eventos coronarianos recorrentes. A redução absoluta do risco para eventos recorrentes é 8%. A redução do risco relativo para eventos recorrentes é 22%. O número necessário para tratar para prevenir um evento recorrente é 12,5.			
26. O estudo recente HERS comparou mulheres que utilizam reposição hormonal com estrogênio versus mulheres que utilizaram placebo. Os resultados revelaram um risco relativo de eventos tromboembólicos de 2,89 para as mulheres que usaram estrogênio. Isso sugere que o tratamento com estrogênio representa risco coronariano. Para que esta diferença seja estatisticamente significante, deve-se verificar o intervalo de confiança. Um exemplo de intervalo de confiança que nos levaria a concluir que a taxa de eventos tromboembólicos venosos foi de fato (estatisticamente) diferente para estes dois grupos de tratamento seria algo que englobe 2,89 e inclui o 1,0 dentro do intervalo.			

Caracterização da prática professional

27 . Marque as opções que traduzem os seus desafios para implementar as práticas da SBE (selecione as três opções mais importantes)
( ) Não existe cultura da prática da SBE em meu local de trabalho
( )Evidências insuficientes para muitos dos problemas de saúde cotidianos
( ) Falta de apoio institucional
( ) Falta de tempo
( ) Falta de acesso às fontes de informação

( ) Método complexo de aprender e de dominar
( ) Não tenho dificuldades para tomar decisões de acordo com os fundamentos propostos pela prática da SBE
( ) **Nenhuma das anteriores, pois não utilizo a prática da SBE.**

28 . **Na minha prática utilizo protocolos clínicos elaborados por (Selecione as opções possíveis):**
( ) Ministério da Saúde
( ) Sociedades Científicas Brasileiras
( ) *Guidelines* Internacionais (ex.: NICE)
( ) Pelo Hospital, Instituto ou local que trabalho
( ) Por mim mesmo, com base em leituras de estudos científicos e meu *background*
( ) Não utilizo protocolos na minha prática

29.Abaixo estão alguns termos relacionados com a apresentação dos resultados das investigações clínicas.

Marque o seu grau de familiaridade com os mesmos.	**Eu entendo e utilizo**	**Eu entendo mas não utilizo**	**Eu não entendo**
Revisão sistemática			
Metanálise			
Intervalo de confiança			
Grade			
Odds ratio, Risco relativo, Risco absoluto			
Número de pacientes necessários para tratar (NNT)			
Razão de verossimilhança (likelihood ratio)			

30. Existem vários recursos disponíveis voltados para as práticas da SBE.

Informe as plataformas que você já consultou.	**Não conheço**	**Conheço mas nunca utilizei**	**Conheço e utilizei apenas algumas vezes**	**Conheço e utilizo regularmente na minha prática**
Cochrane Library (ou Cochrane plus ou Biblioteca Cochrane)				
UptoDate				
Pubmed				
Trip Database				
Dynamed				
Scielo				

BMJ Best Practice				
NICE Clinical Guidelines				
Biblioteca Virtual em Saúde (BVS)				
Portal Saúde Baseada em Evidências do Ministério da Saúde				
Health Systems Evidence e Health Evidence				
Outro (especifique:				

31. Por favor, circule a resposta mais apropriada	**Concordo plenamente**	**Concordo**	**Concordo parcialmente**	**Neutro**	**Discordo parcialmente**	**Discordo**	**Discordo plenamente**
A instituição onde trabalho (nos casos de atuar em duas instituições, responda considerando aquela à qual dedica maior número de horas) implementa as práticas de SBE.	7	6	5	4	3	2	1

APPENDIX 4 - FINAL INSTRUMENT – ENGLISH VERSION

Self-efficacy

Please circle the most suitable answer:	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
1. I am able to incorporate evidence from the scientific literature into my practice.	7	6	5	4	3	2	1
2. I am able to access the best evidence from the scientific literature, in the time I need them.	7	6	5	4	3	2	1
3. I am able to critically assess evidence from the scientific literature.	7	6	5	4	3	2	1
4. I am able to keep up to date with the evidence.	7	6	5	4	3	2	1
5. I am sure that implementing EBP improves my clinical or professional practice	7	6	5	4	3	2	1

Attitude

Please circle the most suitable answer:	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
6. I use research evidence to support my clinical decisions.	7	6	5	4	3	2	1
7. I ask colleagues for help in consulting the scientific literature to find answers to my clinical questions.encontrar respostas às minhas perguntas clínicas.	7	6	5	4	3	2	1
8. I feel uncomfortable when research evidence does not support my clinical or professional practices.	7	6	5	4	3	2	1

Behavior

Please circle the most suitable answer:	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
9. I adopt the EBP because my peers do.	7	6	5	4	3	2	1
10. It is difficult to change my practice to use EBP.	7	6	5	4	3	2	1
11. EBP makes me feel confident in my clinical decisions	7	6	5	4	3	2	1

12. I feel that EBP worsens the quality of my clinical decisions.	7	6	5	4	3	2	1
13. I feel that EBP considers my clinical or professional experience.	7	6	5	4	3	2	1
14. I do not use EBP because I don't have time.	7	6	5	4	3	2	1
15. I do not use EBP in my clinical practice for another reason (please specify).							

Results/Benefits to the patient

Please circle the most suitable answer:	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree
16. The EBP positively affects my clinical decisions	6	5	4	3	2	1
17. The EBP positively affects the health outcomes of the patient under my care.	6	5	4	3	2	1
18. New research evidence results in change in my practice.	6	5	4	3	2	1
19. The EBP provides a shared decision-making with the person under my care	6	5	4	3	2	1
20. The EBP increases the satisfaction of the person under my care.	6	5	4	3	2	1

Knowledge/Skills

Please tick (√) the most appropriate option	Correct	Incorrect	I do not Know
21. Randomized controlled trials and observational studies are equally valid in determining the effectiveness of a treatment.			
22. Publication bias in a meta-analysis represents selection bias.			
23. Randomization in a clinical trial helps to reduce sample size.			
24. Cross-sectional studies are the best designs to assess prognostic factors.			
25. A recent randomized clinical trial found that 29% of diabetics with coronary heart disease treated with pravastatin had a recurrent coronary event during five years of follow-up. Whereas, in the placebo group, 37% suffered recurrent coronary events. The absolute risk reduction for recurrent events is 8%. The relative risk reduction for recurrent events is 22%. The number needed to treat to prevent a recurrent event is 12.5.			
26. The recent HERS study compared women using estrogen replacement hormone versus women using a placebo. The results revealed a relative risk of thromboembolic events of 2.89 for women who used estrogen. This suggests that estrogen treatment poses a coronary risk. For this difference to be statistically significant, the confidence interval must			

be checked. An example of a confidence interval that would lead us to conclude that the rate of venous thromboembolic events was indeed (statistically) different for these two treatment groups would be something that encompasses 2.89 and includes the 1.0 within the interval.			

Characterization of professional practice

27 . Check the options that reflect your challenges to implement EBP (select the three most important options)

( ) There is no EBP culture in my workplace
( ) Insufficient evidence for many health problems
( ) Lack of institutional support
( ) Lack of time
( ) Lack of access to information sources
( ) Complex method of learning and mastering
( ) I have no difficulties in making decisions according to the fundamentals proposed by the EBP.
( ) None of the above, I do not use the EBP

28 . In my practice I use clinical protocols developed by (Select the possible options):

( ) Ministry of Health
( ) Brazilian Scientific Societies
( ) International Guidelines (ex.: NICE)
( ) Hospital, Institute or place where I work
( ) By myself, based on readings from scientific studies and my background
( ) I don't use protocols in my practice

29. Below are some terms related to the presentation of the results of clinical investigations.

Please, check your degree of familiarity with the following terms:	I understand and use	I understand but I don't use	I do not understand
Systematic review			
Meta-analysis			
Confidence interval			
Grade			
Odds ratio, Relative risk, Absolute risk			

Number of patients needed to treat (NNT)			
Likelihood ratio			

30. There are several platforms available aimed at EBP

Please, check your degree of familiarity with the following platforms:	I don't know	I know but I've never used it	I know and I've only used it a few times	I know and use it regularly in my practice
Cochrane Library (ou Cochrane plus ou Biblioteca Cochrane)				
UptoDate				
Pubmedyu				
Trip Database				
Dynamed				
Scielo				
BMJ Best Practice				
NICE Clinical Guidelines				
Biblioteca Virtual em Saúde (BVS)				
Portal Saúde Baseada em Evidências do Ministério da Saúde				
Health Systems Evidence e Health Evidence				
Outro (especifique)_____				

31. Please circle the most suitable answer:	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Agree
The institution where I work (in the case of working in two institutions, answer considering the one to which you dedicate the most hours) implements EBP..	7	6	5	4	3	2	1

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	Title page
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	3-4
Methods			
Study design	4	Present key elements of study design early in the paper	4 and 7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	8
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	8
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Not appicable
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*6- 9*
Bias	9	Describe any efforts to address potential sources of bias	6- 8
Study size	10	Explain how the study size was arrived at	5 and 8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6 and 9
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6 and 9
		(*b*) Describe any methods used to examine subgroups and interactions	Not applicable
		(*c*) Explain how missing data were addressed	Not applicable
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	8 -9
		(*e*) Describe any sensitivity analyses	9
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Figure2 and page 11
		(b) Give reasons for non-participation at each stage	Figure2 and page 11
		(c) Consider use of a flow diagram	Figure2 and page 11
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Table 1 and page 11

		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	Table 2-5, page 9-12
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Table 2-5 page 9-12
		(*b*) Report category boundaries when continuous variables were categorized	Not applicable
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not applicable
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Not applicable
Discussion			
Key results	18	Summarise key results with reference to study objectives	13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13-15
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	13-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	13-15
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Not applicable

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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DESIGN AND VALIDITY OF AN INSTRUMENT TO ASSESS HEALTHCARE PROFESSIONALS' PERCEPTIONS, BEHAVIOR, SELF-EFFICACY AND ATTITUDES TOWARD EVIDENCE-BASED HEALTH PRACTICE. I-SABE

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TITLE: DESIGN AND VALIDITY OF AN INSTRUMENT TO ASSESS HEALTHCARE PROFESSIONALS' PERCEPTIONS, BEHAVIOR, SELF-EFFICACY, AND ATTITUDES TOWARD EVIDENCE-BASED HEALTH PRACTICE. I-SABE

SHORT TITLE: HEALTHCARE PROFESSIONALS' PERCEPTIONS, AND ATTITUDES TOWARD D EVIDENCE-BASED HEALTH PRACTICE

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ABSTRACT

Objectives: To develop and validate an instrument to measure Brazilian healthcare professionals' perceptions, behavior, self-efficacy, and attitudes towards Evidence-based health practice.

Design: Validation of an instrument using the Delphi method to ensure content validity and data from a cross-sectional survey to evaluate psychometric characteristics (psychometric sensitivity, factorial validity, and reliability).

Setting: National Register of Health Establishments database.

Participants: We included clinical health professionals who were working in the Brazilian public health system.

Results: The Instrument to assess Evidence-Based Health (I-SABE) was constructed with five domains: Self-efficacy; Behavior; Attitude; Results/Benefits, and Knowledge/Skills. Content validity was done by 10-12 experts (three rounds). We applied I-SABE to 217 health professionals. Bartlett's sphericity test and the Kaiser-Meyer-Olkin (KMO) index were adequate ($\chi 2 = 1455.810$, $p < 0.001$; KMO = 0.847). Considering the factorial loads of the items and the convergence between the Scree Plot and the Kaiser criterion the four domains tested in this analysis, explaining 59.2% of the total variance. The internal consistency varied between the domains: Self-efficacy ($\alpha = 0.76$), Behavior ($\alpha = 0.30$), Attitudes ($\alpha = 0.644$), Results /Benefits to the patient ($\alpha = 0.835$).

Conclusions: The results of the psychometric analysis of the I-SABE confirm the good quality of this tool. The I-SABE can be used both in educational activities as well as an assessment tool among healthcare professionals in the Brazilian public health settings.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- The I-SABE (Instrument to assess Evidence-Based Health) was developed through a rigorous process, which involved the integration of evidence from the literature using a theoretical framework, a Delphi survey for the validity of the content, and psychometric assessments.
- Although the response rate was 15%, this survey presented a good number of respondents from different types of healthcare professionals coming from diverse practice settings with different levels of experience, thus providing a good assessment of the overall knowledge and use of Evidence-based health practice in public health settings.
- Composite reliability was not performed in this study, therefore, future studies in a larger sample of health professionals are needed to assess reliability with greater robustness, as well as confirmatory factor analysis.

INTRODUCTION

Evidence-based health practice (EBP) is identified as one of the most important factors for improving the results and sustainability of health systems and it has become an important competency for health professionals involved in patient care,[1]. EBP is defined as the integration of best research evidence with clinical expertise and patient values,[2]. There are several studies of improved patient outcomes following implementation of EBP such as reductions in length of hospital stay and costs, increased patient satisfaction, and the elimination of unnecessary or ineffective practices,[2].

Although the incorporation of scientific evidence as a basis for health decision-making is considered a critical factor to improve quality of care, the application of EBP is remains a major challenge,[3-5]. Studies showed competency gaps and low implementation rates among healthcare professionals across diverse practices and settings. Understanding of knowledge, skills, attitudes, and barriers related to EBP among healthcare professionals can help to elaborate effective and systematic strategies for integrating the EBP in healthcare services,[5]. Despite the availability of tools to assess EBP implementation among healthcare professionals, most of them have been developed to assess knowledge and skills and none is able to cover all domains established by the Classification Rubric for EBP Assessment Tools in Education (CREATE) framework,[6-8]. According to a recent systematic review which includes 12 validated tools, few demonstrated multiple (≥ 3) types of established evidence on the reliability and validity of the instrument, and none addressed domains such as self-efficacy, behaviors, or patient benefit,[9].

These limitations might compromise the ability to evaluate the impact of EBP implementation on health outcomes. The development of a validated instrument is important to determine gaps, to design interventions needed for integrating this competency in healthcare organizations, and to assess the effectiveness of future interventions in different contexts (e.g. hospitals, primary care services),[5].

In Latin America, despite increased efforts to disseminate and apply the EBP concepts, the application of EBP among healthcare professionals is still limited,[10-11]. Research is lacking that supports the development of interventions to promote the EBP implementation in the clinical routine,[10-11]. In addition, no study developed a valid and reliable instrument to assess the gaps in EBP implementation among healthcare professionals in the Brazilian context. Thus, this study aims to develop and validate an instrument for determining healthcare professionals' perceptions, behavior, self-efficacy, and attitude related to EBP in Brazil.

METHODS

The study was approved by the Ethics Committee for Research at the University of Sorocaba (number 1.425.808), and all participants gave written, informed consent before interviews or survey participation. Identifiable information, such as names, phone numbers, and addresses were not collected from participants in order to fully protect their privacy.

The development was conducted in a systematic manner, using an accepted measure development methodology which included development of items, content validity, pilot study, and evaluation of psychometric characteristics. The flow of instrument development is shown in Figure 1.

Development and validation of the instrument

Development of items

We drew on the EBP conceptual framework proposed by the Classification Rubric of EBP Assessment Tools in Education (CREATE) to guide the item development process,[12-14]. This framework is a common taxonomy for new and existing tools and it is designed to help EBP educators/researchers identify the best assessment tool available and provide guidance for developers of new EBP assessment tools. Using this framework, the nature of an assessment can be characterized with regard to the 5-step EBP model (Ask, Search, Appraise, Integrate Evaluate), type(s) and level of educational assessment specific to EBP, audience characteristics, and learning and assessment aims,[12-14].

A scoping review was used to systematically select and summarize existing tools with established evidence on the reliability and validity,[14-21]. We used the CREATE framework to guide the data extraction of potential domains. Items were pooled by two researchers in five domains established by CREATE framework: (1) attitudes, (2) self-efficacy, (3) knowledge/skills, (4) behaviors, and (5) =results/benefits for patients. The Excel spreadsheet was used to extract and analyze the items. Disagreements about the items included in each domain were resolved by a consensus-based discussion.

Considering that we used the CREATE framework, the method used to identify the items was the modified frameworks synthesis,[22]. This method is an excellent tool for supporting qualitative analysis because it provides a systematic model for managing and mapping the data,[22]. The definitions of domains derived from this framework are presented in Supplementary Appendix I. We used these definitions as a guide for the development of new items if there is no existing instrument.

After translation, technique revision and semantic evaluation by the research group, the initial item pool was discussed and critically assessed and appropriate changes to the translation were made to ensure consistency. After this stage, we used the consensus approach to ensure the content validity of instrument which is described in the later section entitled "Content validity".

Content Validity

Content validity refers to the degree to which elements of the instrument are relevant to and representative of the targeted construct for a particular assessment purpose,[23]. This could be done using the results of several examiners' analyses (panel of experts) who verify the items' representation regarding content areas and the relevance of the objectives to be measured. We used a panel of experts through a consensus technique, according to simplified Delphi's method,[24].

The Delphi method is a structured process distributing rounds of the questionnaire in analysis to gather information and set priorities or gain consensus regarding a specific issue. This method is characterized by anonymity, iteration, controlled feedback, and stability in responses among those with expertise on a specific issue,[25-26]. The Delphi technique was conducted in online web surveys where the panel of experts filled out the form given their responses directly and blinded from others,[26].

Selection and recruitment of experts

The panelists were identified through an advanced search system of the Lattes platform on the National Council for Scientific and Technological Development (CNPq) website (www.cnpq.br/lattes), using the following keywords: evidence-based health, evidence-based health practices, evidence-based medicine, questionnaire, measurement instruments, questionnaire validation, and psychometric analysis. The Lattes Platform is a publicly available

information system about individual researchers working in Brazil maintained by the Brazilian Federal Government.

As this project aims to create an instrument to assess knowledge, skills, and attitudes, we understand that the panel of experts should be composed of researchers working with EBP and healthcare professionals who use EBP in their practice. Considering theses aspects, the following criteria were used for selecting a panel of experts: publication of at least three peer-reviewed academic indexed journal articles on EBP or projects/articles that involved validation of questionnaires in the health area published in the last four years, or healthcare professional with at least five years of experience in EBP. We identified 25 potential participants who were then invited by email. Each potential panelist was informed about the voluntary nature of the study and was provided with full study information, outlining the aim of the study, the extent, and the timing of their expected involvement.

Rounds

We planned at least three rounds. During the rounds, the panel board members were invited to comment on grammar and phrasing to improve uniform interpretation of items and prevent socially desirable responses. The content assessment was done considering Theoretical Dimension, Theoretical Relevance, Clarity, and Relevance or representativeness as it was explained in our protocol,[27]. For each item in the questionnaire, we used the traditional 4-point Likert scale in which there is no neutral option (1=completely disagree; 2 = disagree; 3 = agree and 4=completely agree). In this case, neutral option is useless where researchers prefer to extract a specific opinion from the respondents on clarity, and relevance or representativeness of each item in the instrument,[28]. Additionally, following each item, a space was included for panelists to write their suggestions for improving the item or making comments. If the expert marked the answer I completely disagree with or disagree with, he must justify his answer. The experts were also offered the opportunity to add items. If they suggested additional items or dimensions, these were submitted to be assessed in the next round. Doubts about comments or suggestions were resolved with the experts by telephone or email. To avoid imposing our views on participants, the researchers only contacted panelists if there was some doubt about their suggestions in order to avoid possible mistakes related to elaboration of items. After each round, the results and comments were analyzed and summarized by the research team in order to guide the instrument revision. The modified instrument was again sent to the panelist group for the next round of analysis. Each round lasted

30 days corresponding to 15 days for the panelists' answers and another 15 days for the researchers' analysis

Descriptive analyses

After each round, data generated from completing the online questionnaire were extracted to Microsoft Excel for descriptive analysis (frequencies and percentages) to determine the percentage rating of agreement or disagreement among experts.

Determining consensus

We used the traditional 9-point scale (1=extremely irrelevant to 9=extremely relevant) to assess each item. The participants' responses were categorized as irrelevant (1–3), equivocal (4–6), and relevant (7–9). For each item, the consensus was reached if at least 80% of the participants' votes belong to the same category (1–3, 4–6, or 7–9), [29-30]. Items that did not reach a consensus was reviewed and submitted for the next round. During the Delphi process, only one panelist suggested significant changes in the instrument. The items were revised and returned to the vote in the next round.

Criteria for dropping items at each round

If 80% or more of the participants' votes completely disagree or disagreed, the item was excluded from the instrument. After the end of content validation, this stage was complemented with exploratory factor analysis which is described in the later section entitled "Factorial validity".

Feedback

Quantitative (percentage rating) and qualitative feedback from each round of the Delphi process were incorporated into the survey for the next round. The expert panel was instructed to consider the feedback.

Anonymity

The anonymity among panelists was ensured during the Delphi process as the entire was traditionally handled via remote participation that was coordinated by the researcher(s),[31]. Responses and feedbacks from panelists are always anonymous to everyone except the researcher(s). Therefore, the panelist didn't know the identities of each other or their comments/suggestions.

Pilot Study

In order to identify possible doubts regarding the understanding of the items, panelists were asked to indicate health professionals to answer the instrument. Each panelist appointed three health professionals, totaling 36 potential participants. Of these, 28 agreed to participate in the research. If any of the nominated professionals were a panelist during the content validation, this professional was not included in the pilot study. Therefore, the researchers asked to panelist appoint another possible participant.

Health professionals who agreed to participate in the pilot study had to answer the following three questions about the instrument in order to identify difficulties in the use of the I-SABE: (1) How long did it take you to answer the instrument?; (2) Was there any difficulty in understanding any question? If YES, please describe it below. (3) Did you have difficulty with the topic?

In the case of a misunderstanding regarding one or more items of the instrument, and of over 20% of the assessed sample, the parts were reviewed by the expert panel.

Evaluation of Psychometric Characteristics

Study design: this step is a cross-sectional study.

Setting

We gathered the survey participants from the National Register of Health Establishments database (CNES), which hosts free access to data from all public health institutions of Brazil. Queries on CNES can be performed at http://cnes.datasus.gov.br/ filtering by geographic location (i.e. State and Municipality), and type of establishment. It also provides the name, role,

workload, and employment contract of each healthcare professional. We selected only medical professionals, nurses, dentists, and pharmacists who are working in Brazil's public health sector (Unified Health Care System).

Participants

We included clinical health professionals who are currently working in the public health system and excluded professionals on leave from work for limited or unlimited time during the period of application of the questionnaire, or retired professionals.

Study size

The estimated minimum sample size was based on the requirement of 5-10 subjects per model parameter, [32]. In 2016, government database registered 240,750 physicians; 182,861 nurses, 58,421 dentists, and 20,593 pharmacists. Thus, we choose to work with a representative sample bigger than that recommended for the statistical analysis. Considering a 30% response rate, we estimate a sample size of 1,270 respondents needed to answer one of our questions (percentage of prior contact, familiarity with EBP), with 5% precision. To obtain this precision we dichotomized the first item of the survey (being favorable or not to EBP) assuming maximum variability (50% of responses favorable to EBP). A confidence interval of 95% was applied to the percentage of favorable responses.

Randon Sampling

The random sample was performed with the Microsoft Excel® software in a central computer considering some stratifications (e.g. type of professional, geography, settings, etc). We recruited potential participants through email with an invitation letter containing a link to the web survey. Professionals without e-mail addresses available in CNES were be contacted by phone or fax at their workplace and will be sent a physical survey by postal mail to their work addresses.

Data Collection

After health professionals agreed to participate in the study, the instrument I-SABE was sent *online* through the *survey monkey* platform (https://pt.surveymonkey.com/).

Data Analysis

Data analysis were performed using SPSS (V.20.0) and Stata (V.12.0).

Psychometric sensitivity

The summary and shape measures of the questionnaire items distribution were used to estimate their psychometric sensitivity. Items with a skewness (Sk) greater than 3 and kurtosis (Ku) greater than 7 in absolute values are considered to have psychometric sensitivity issues, [30]. The diagnosis of multivariate outliers is to be performed by computing the Mahalanobis distance, [30].

Factorial validity

The Exploratory factor analyses (EFAs) were directed to the following domains: Self-efficacy, Behavior, Attitudes, and Results/Benefits. Therefore, only 20 items were included in this analysis. All items from domain Knowledge/Skills and item 21 from the domain attitude were not included since they are not measuring latent variables.

EFAs were conducted by using Principal Axis Factoring in order to partition systematic and error variance in the solution,[33, 34]. Promax oblique rotation was be used, allowing for factor inter-correlations. To promote simple structure, items were retained on a factor if they load at least 0.30 on the primary factor and less than 0.30 on all other factors,[33].

Reliability

The reliability of an instrument used for data collection is its coherence, determined by the constancy of the results,[35]. A reliable (stable) measure is consistent and precise because it provides a constant measurement of the variable,[35]. To estimate the reliability, both the internal consistency and stability were evaluated.

We explored internal consistency, that is, the reliability estimated from the internal consistency, by using standardized alpha Cronbach coefficient (α), where Cronbach α of 0.7 to 0.8 is considered satisfactory, 0.8 to 0.9 is good, and 0.9 is excellent,[36].

Patient and public involvement

No patient was involved.

RESULTS

Development and validation of the instrument

The results of the development and validation of the instrument are described in figure 2.

Development of items

We developed a preliminary instrument containing 31 items across five domains: Self-efficacy, Behavior, Attitudes, Results/Benefits to the patient, and Knowledge/Skills, Supplementary Appendix 1. The instrument was named I-SABE (Instrument to assess Evidence-Based Health)

Content Validity

Three rounds of expert panels were carried out to assess the preliminary instrument. Of the 15 potential experts selected, 12 (80%) agreed to participate in the study. The second and third rounds of instrument evaluation had the participation of 10 (66.7%) experts. Most respondents completed the questionnaire between 15 to 20 minutes.

In the first round, the experts identified items that were not clear. This process resulted in the exclusion and convergence of items according to the consensus adopted. Thus, four items out of 31 instrument items were removed, resulting in 27 remaining items (item 6 was incorporated in the item 2, items 7, 13, and 14 were excluded).

Some experts highlighted the need to include new items, for example, in the "Attitude" domain, the following items were included: "The practice of EBP increases the satisfaction of the person in my care" and "The practice of EBP provides an outlet of decision shared with the person in my care" (item 32 and 33 were added).

In the second round, a consensus was reached for 100% of the domains selected. However, experts emphasized the importance of characterizing the health professional's practice, suggesting the inclusion of items that reflect clinical practice. Thus, after the second round, four items were added, resulting in a total of 31 items. These items, item 21 from the Attitude domain and all items from the Knowledge/Skill domain were not included in the analysis stage of psychometric characteristics, as these questions are not measuring latent variables.

In the third round, experts reached a consensus on the four items suggested in the previous round. Thus, they were included in the instrument. At the end of the content validity, the instrument I-SABE was finalized with 31 items across five domains. All changes, inclusion, and exclusion of the items are described in Supplementary Appendix 2.

Pilot study

After determining the content validity, the instrument was applied to a sample of 28 health professionals which included physicians, nurses, and pharmacists. Based on responses from health professionals, we modified item 19 "Time is a factor that favors my use of EBP". This item was considered incomprehensible item. The item was reevaluated with members of the expert committee and changed to "I don't use EBP because I don't have time". At the end of this stage, 77.7% of the participants reported not feeling any difficulty in filling out the I-SABE instrument and the average completion time was 12 minutes.

These modifications were included in the new version of I-SABE included which was submitted to the assessment of validity and reliability. The time of each participant took to complete the questionnaire varied between 24 and 66 minutes. The mean time that participants took to complete the questionnaire was 12 minutes. The perceived length of the same was deemed appropriate for most participants (88%). The mean perceived difficulty of the questionnaire was 2 (0 = very easy; 10 = very difficult).

Evaluation of Psychometric Characteristics

Participants

Of the 2,550 health professionals listed, 1,380 subjects were recruited from a random sampling. At the end of this stage, the response rate was 15%, Figure 3.

The demographic and academic characteristics of 217 Brazilian health professionals who participated in the study were summarized in Table 1. The majority of sample were women (n=148; 69.5%), pharmacist (n=84; 38.7%), have specialization degree (n=90; 41.5%), and work in primary care (n=70; 32.3%). Detailed characteristics of survey respondents are presented in table 1.

Psychometric sensitivity

Skewness and Kurtosis are within the commonly agreed-upon thresholds of lower than 1 for skewness and lower than 3 for kurtosis, indicating a normal distribution of the I-SABE, and, therefore, an adequate psychometric sensitivity, Table 2.

Factorial validity

The sample suitability indices presented good conditions for the factorial analysis: Kaiser-Meyer-Olkin (KMO) of 0.847 and Bartlett's sphericity with p <0.001, Table 3. Visual inspection of the scree plot (Figure 4) revealed that the point of inflexion in the plot occurred at the fifth factor, indicating that four factors should be retained.

Varimax orthogonal rotation allowed a more precise classification of each of the factors (domains), Table 4.

The analysis revealed four factors whose eigenvalues were > 1, accounting for 52.6% of the total variance in the measure. After the completion of this step, Item12 was removed because it presented a confounding factor and with a factor load below 0.4. The final instrument is described in Supplementary Appendix 3 (Portuguese version) and Supplementary Appendix 4 (English version).

Reliability

The reliability of the I-SABE instrument was assessed by Cronbach's alpha, the values were calculated for each factor, as described in Table 5.

DISCUSSION

The robustness of the results of a study depends on the quality and validity of the instrument used. This study presented the development and the initial validation process of an instrument (I-SABE) to verify different aspects of EBP, using a rigorous methodology. Our findings demonstrated that the I-SABE has an overall good level of psychometric properties measured as content and factorial validity, internal consistency reliability in order to measure the four domains of EBP among the different types of health professionals (mainly pharmacists, physicians, and nurses), indicating that this instrument is an efficient and effective instrument for use in research and public health settings.

Although several tools combine more than one domain of EBP assessment in a single instrument, these predominantly focus on certain domains (i.e., knowledge and skills) and EBP steps (i.e. appraise), [6, 9, 37-39]. To our knowledge, I-SABE is the first tool that has addressed the following five domains in a single instrument: 1-Self-efficacy; 2- Behavior; 3-Attitude; 4-Results/Benefits and 5-Knowledge/Skills, [6,9].

The I-SABE was designed to evaluate EBP implementation among healthcare professionals with different levels of experience in Brazilian Public Health. Two instruments that assess EBP competencies have been culturally adapted and validated in Brazil, [40-41]. However, these instruments were developed to assess EBP in specific populations such as medical students and nurses. Furthermore, in the literature, few validation studies were developed with a multidisciplinary sample, [42]. However, for EBP to be fully implemented, it is essential to clarify possible differences among healthcare professionals since the EBP is a shared competency.

Regarding the five domains evaluated, the “self-efficacy" domain had a high factor load for the items and demonstrated a good correlation with the items, suggesting an adequate construction that allows measuring the self-efficacy of health professionals in the use of EBP. The domain "results/benefits for the patient" accurately also reflects the content of the item and the direction of the I-SABE. This domain is considered an important aspect of EBP since it focuses on the impact of EBP on practice and results,[13].

The internal consistency of I-SABE was assessed by Cronbach’s alpha. Some authors recommend that Cronbach’s alpha value must be at least between 0.60 and 0.70 to have a reliable instrument, [43-44]. Based on this evidence, it can be observed that Self-efficacy, Results /Benefits to the patient, and Attitude domains show adequate internal consistency.

On the other hand, we observed a lower internal consistency of the "behavior" domain. Low internal consistency suggested that the items within the construct of "behavior" were low correlated. A possible explanation might be the low number of items (n = 3) in this domain. Cronbach's alpha values are quite sensitive to the number of items in the scale, and with short scales (< 10 items) it is common to find quite low Cronbach's alpha values.

This limitation is in agreement with the findings reported for other studies. For instance, in the validation study of the ACE scale (Assessing medical trainees' competency in evidence-based medicine), the authors identified a low internal consistency to questions about a critical appraisal, with specific reference to selection and performance bias,[45]. Findings from the evidence-based practice scale (EBP-KABQ) also observed lower internal consistency of the "knowledge" domain compared to other items, suggesting that the six items within this construct were not adequately correlated,[46].

Finally, Although the "Knowledge and Skill" domain was not included in the analysis stage of psychometric characteristics since these questions are not measuring latent variables. The I-SABE considered the requirements from the CREATE framework, examining user knowledge and skills across steps 1–4 of the EBP process,[13].

Strengths and Limitations

This study was developed through a rigorous process, which involved the integration of evidence from the literature using a theoretical framework, a Delphi survey for the validity of the content, and psychometric assessments. As a strength, we use the CREATE taxonomy as a framework to elaborate and the instrument,[13]. This framework has been developed by a specialist group and describes seven areas of evaluation of EBP educational interventions, out of which five were used as a framework for the I-SABE. Secondly, the content of the instrument was based on a literature review and was validated by a panel of experts, and was pretested, which strengthened its validity. Thirdly, we performed a simple random sampling of Brazilian healthcare professionals to select the participants of the study. Although the sample was relatively low when compared to the total number of professionals previously selected, the number of 217 healthcare professionals was sufficient to perform factors analysis since sample size calculation was based on a participant to item ratio of 5:1,[32].

However, there are some limitations to be considered. Web surveys are known to produce lower response rates compared to other data collection modalities,[47]. Although the response

rate was 15%, this survey presented a good number of respondents from different types of healthcare professionals (physicians, nurses, and pharmacists) coming from diverse practice settings with different levels of experience, thus providing a better idea of the overall knowledge and use of EBP in public health settings than many previous studies, frequently focused on a specific profession and a particular setting. Additionally, we had a higher proportion of pharmacists (38.7%) compared with other healthcare professionals (30.8% physicians: 17.1% nurses and 13.4% other healthcare professionals). It is important to note that we only included clinical pharmacists who work with healthcare teams in patient care and who was involved in the selection of intervention or medication for patients. Pharmacists have a crucial role in the health system to maintain the rational use of medicine and provide pharmaceutical care to patients,[48]. EBP is an essential approach to promote the rational use of medications, making sure that patients receive the right medicine in the right dose for the right diagnosis at the right time at the lowest possible cost suitable to their requirements,[48]. Finally. the composite reliability was not performed in this research. It is suggested that it be verified using future studies to assess reliability with greater robustness, as well as confirmatory factor analysis, which makes it necessary to compose a larger sample of health professionals to administer the instrument.

Implications for clinical practice and future research

The I-SABE was found to be a valid and reliable instrument to assess self-efficacy, behavior, attitude, and results/benefits toward EBP in Brazil. This tool can be used to measure the EBP competencies of healthcare professionals in Brazil and to identify barriers to and facilitators of EBP in clinical practice in order to improve the implementation of this practice. In addition, the instrument can be used in educational activities, as well as an assessment tool among healthcare professionals in different public healthcare settings.

Conclusion

The I-SABE is a valid and reliable instrument to assess the EBP among healthcare professionals. The application of this instrument is simple, quick, and provides a reliable assessment of the EBP in the main stages of the execution of the EBP in order to favor their

implementation. Future research is required to further examine other psychometric properties of I-SABE and its utility in patient care.

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Table 1- Demographic, academic, and setting of work characteristics of participants.

Characteristics	N=217 (%)
Sex	
Female	148 (72.7)
Male	69 (30.8)
Profession	
Physician	67 (30.8)
Pharmacist	84 (38.7)
Nurse	37 (17.1)
Dentist	4 (1.8)
Physiotherapist	10 (4.6)
Others	15 (6.9)
Time since graduation	
< 10 years	95 (43.8)
11-20 years	88 (40.5)
> 20 years	34 (15.7)
Education/ Highest professional degree	
Post-doctoral	14 (6.3)
Doctorate	23 (10.4)
Master's degree	57 (25.8)
Specialization degree	90 (41.5)
Graduate degree	33 (14.9)
Setting of work	
Primary care	70 (32.3)
Hospital	54 (24.9)
Outpatient clinic	35 (16.1)
University	43 (19.8)

Others	15 (6.9)

Table 2- Summary and shape measures of instrument I-SABE

Items	Mean	Median	Standard deviation	Skewness	Kurtosis
1	1.98	2.00	1.02	1.30	2.95
2	2.18	2.00	1.22	1.43	2.17
3	2.35	2.00	1.06	0.80	0.76
5	2.49	2.00	1.06	0.83	0.75
8	1.61	1.00	0.83	1.49	2.37
9	2.10	2.00	1.06	0.96	0.67
10	2.55	2.00	1.44	1.29	1.37
11	3.10	3.00	1.69	0.66	-0.62
12	4.25	4.00	1.48	0.12	-1.09
15	5.20	6.00	1.45	-0.43	-0.99
16	5.30	6.00	1.42	-0.76	-0.13
17	2.10	2.00	1.05	1.21	2.88
18	3.05	3.00	1.37	0.73	0.13
19	5.05	5.00	1.59	-0.06	-0.56
20	6.04	6.00	1.14	-1.69	3.65
22	2.26	2.00	1.11	1.15	1.77
23	2.22	2.00	0.96	0.91	1.44
24	2.36	2.00	1.00	0.92	1.38
32	2.48	2.00	1.12	0.86	0.69
33	2.69	3.00	1.14	0.66	0.39

Table 3 - Value of Kaiser-Meyer- Olkin and Bartlett's Tests

Tests		Results
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.847
Bartlett's Test of Sphericity	Approx. Chi-Square	1455.810
	Df	210
	Sig.	0.000

Table 4- Factor structure matrix with orthogonal varimax rotation of instrument I-SABE.

Item	Factorial analysis			
	1	2	3	4
1.I am able to incorporate evidence from scientific literature into my practice.	0.171	**0.611**	-0.183	0.359
2. I am able to access the best evidence of scientific literature in the time I need them.	-0.021	**0.773**	-0.155	-0.063
3. I am able to critically evaluate the evidence from the scientific literature.	0.133	**0.762**	-0.120	-0.050
5. I am able to keep up to date with the evidence	0.177	**0.778**	0.029	0.029
8. I am sure that the implementation of Evidence-Based Health (EBP) improves my clinical or professional practice.	**0.623**	0.039	-0.179	0.094
9. I use evidence from research to support my clinical decisions	0.410	0.303	0-.224	**0.539**
10. I ask colleagues for help in consulting the scientific literature to find answers to my clinical questions.	0.015	0.059	0.068	**0.641**
11. When the research evidence doesn't support my reliable clinical routines, I feel uncomfortable.	-0.092	-0.034	0.062	**0.650**
12. I prefer to use my experience to make clinical decisions	**0.373**	-0.063	**0.369**	**0.370**
15. I adopt the EBP practice because my colleagues do it.	0.104	0.007	**0.631**	0.265
16. It is difficult to change my practice to use EBP	-0.375	-0.375	**0.582**	0.078
17. EBP makes me feel confident in my clinical decisions.	**0.668**	0.048	-0.206	0.116
18. I feel that EBP considers my clinical or professional experience.	**0.538**	0.321	0.204	0.109
19. I don't use EBP because I don't have time	0.023	-0.399	**0.633**	-0.021

20. I feel that EBP worsens the quality of my clinical decisions.	-0.325	-0.085	**0.582**	-0.019
22. EBP positively affects my clinical decisions.	**0.667**	0.070	-0.466	0.094
23. EBP positively affects the health results of the person under my care.	**0.701**	0.048	-0.323	0.032
24. New research evidence results in a change in my practice.	**0.609**	0.042	-0.222	0.149
32. EBP provides a decision-making shared with the person under my care.	**0.725**	0.160	0.101	-0.101
33. EBP increases the satisfaction of the person under my care.	**0.754**	0.121	-0.021	-0.152
Values	**5.838**	**2.110**	**1.847**	**1.242**
Explained Variance	**27.801**	**10.048**	**8.795**	**5.913**

*I-SABE: Instrument to assess evidence-based heal

Table 5 - Cronbach's alpha values for each factor (domain)

Factor	*Cronbach's Alpha*	*Cronbach's Alpha Based on Standardized Items*	Number of Items
Self-efficacy	0,762	0,764	4
Behavior	0,302	0,322	3
Attitudes	0,644	0,650	4
Results	0,835	0,840	5

Figure 1. Study steps

Figure 2. Results of development and validation of the instrument

Figure 3. Flowchart of sample composition

Figure 4. Scree plot graphic

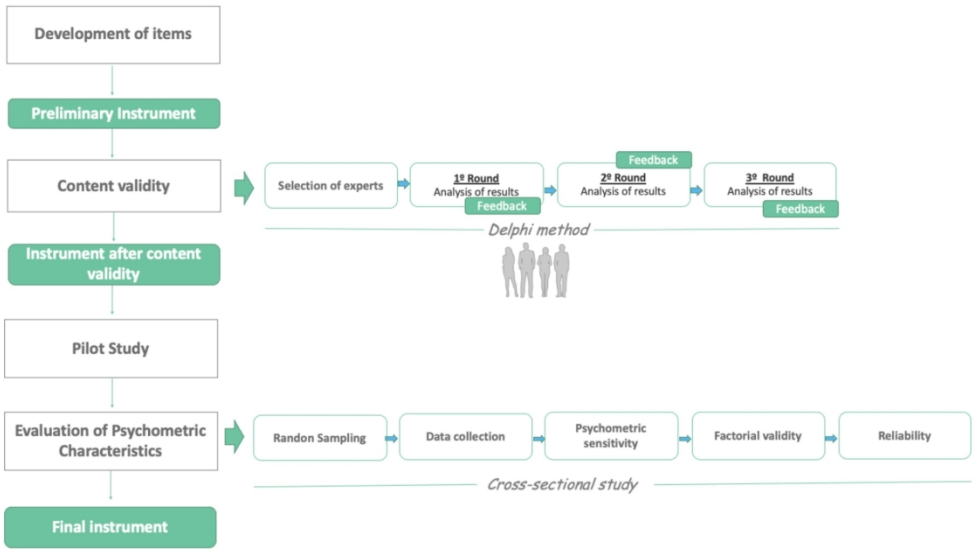

Figure 1. Study steps

246x137mm (300 x 300 DPI)

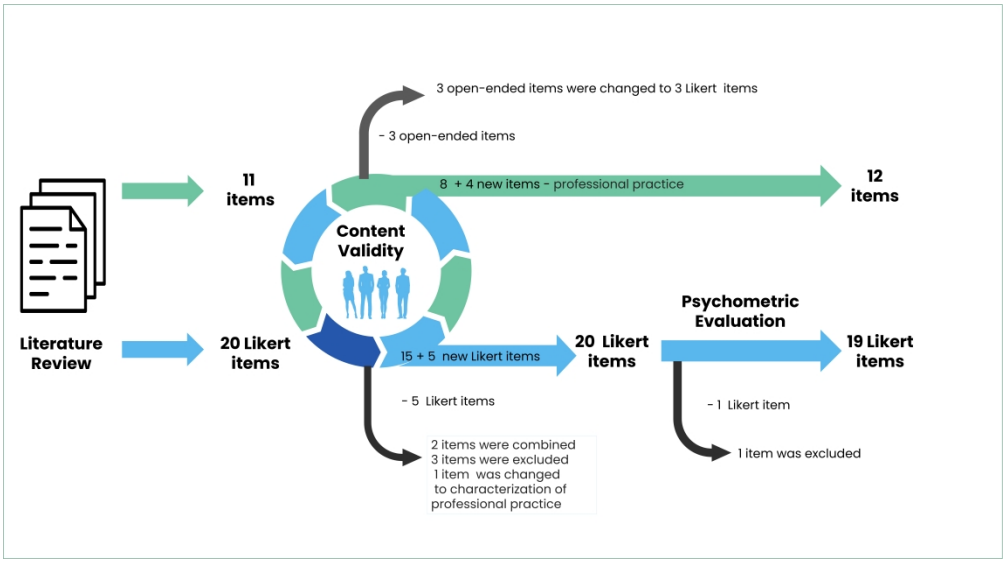

Figure 2. Results of development and validation of the instrument

685x381mm (300 x 300 DPI)

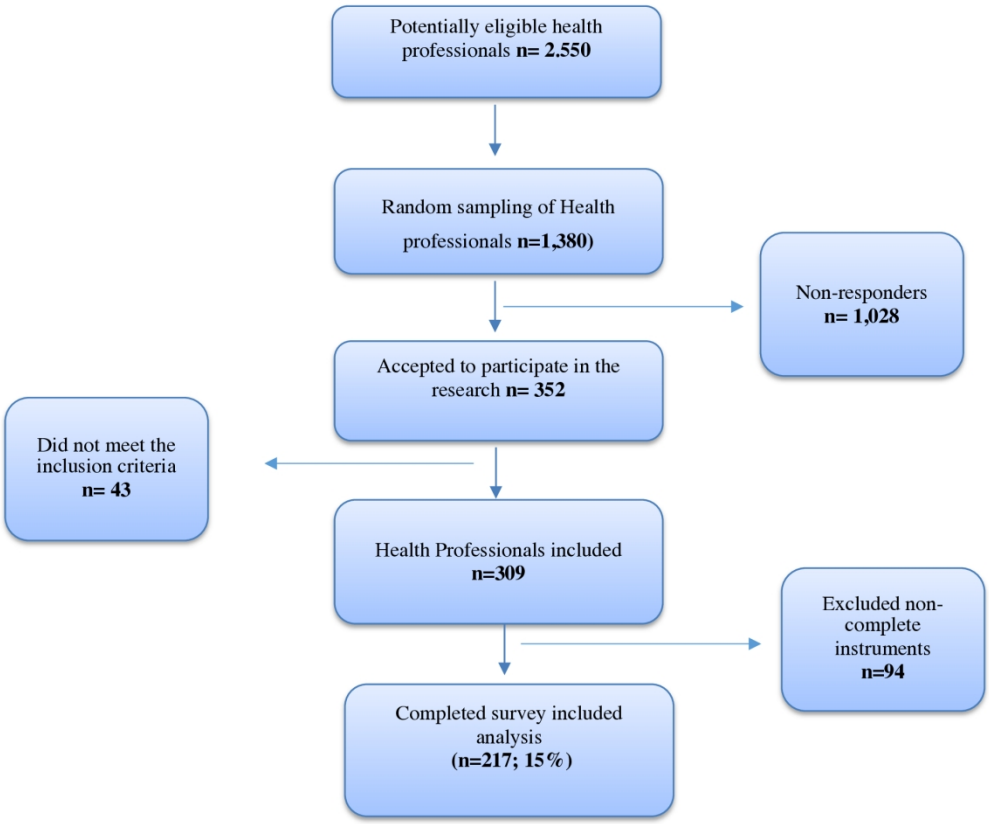

Figure 3. Flowchart of sample composition

170x140mm (300 x 300 DPI)

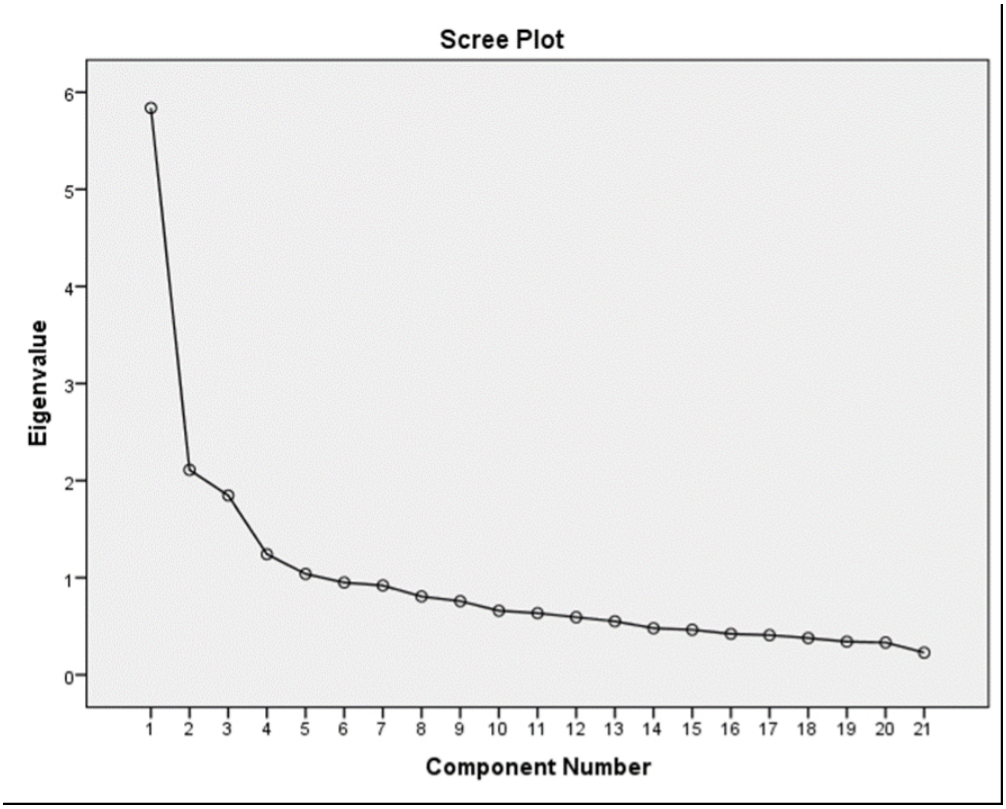

Figure 4. Scree plot graphic

143x115mm (157 x 157 DPI)

APPENDIX 1 - Definition of domains in SBE practices.

Domain	Definition
Self-efficacy	It refers to people's judgments regarding their ability to perform a certain activity (BANDURA, 1977). For example, an individual's confidence in his or her ability to search for evidence may be related to his or her efforts to search for scientific evidence (SALBACH et al., 2009).
Knowledge	It is attributed to the concepts about SBE. Knowledge assessments can measure an individual's ability to define SBE concepts, list basic EBP principles or characterize levels of scientific evidence. Thus, knowledge assessment questions can ask health professionals to define the "Number Needed to Treat" or identify the "type of study" most appropriate to answer a given clinical question (TILSON et al., 2011).
Behavior	It refers to the individual's real performance in his practice. As for example, the professional changes his service after analyzing a synthesis of evidence (TILSON et al., 2011)
Attitudes	Attitudes are strong indicators of future behavior (AJZEN, 1991) There is evidence that individuals' confidence in the benefits of evidence-based practices are related to the degree that they implement the practice of EBP in their work (MEINYK et al., 2017).
Results / Benefits to the patient	The goal of EBP is to improve health care outcomes for patients. Therefore, it is essential to assess the impact of EBP on the benefit of patients (STRAUS et al., 2004) (NABULSI et al., 2007).
Skills	Skills refer to the application of knowledge, ideally in a practical environment (FREETH et al., 2006) Skill assessment would require clinicians to "do" a task associated with EBP, such as conducting research, use a critical assessment tool to summarize the quality of the study, for example, or

	calculating the number needed to treat (TILSON et al., 2011).

APPENDIX 2 - Changes to the items that make up the I-SABE, during content validation.

I-SABE preliminary	I-SABE after content validity
Self-efficacy	
1- I am confident in my ability to adopt evidence-based health practice.	1- I am able to incorporate evidence from the scientific literature into my practice.
2- I feel able to find the best available evidence	2- I am able to access the best evidence from the scientific literature, in the time I need them.
3- I feel that I am able to critically assess the evidence coming from my search of the scientific literature.	3- I am able to critically assess evidence from the scientific literature.
4- I feel I am able to apply the evidence from the research to the care of individual patients.	**This item was excluded.**
5- I feel able to keep up with the evidence.	5- I am able to keep up to date with the evidence.
6- I feel able to access (search and find) the best clinical evidence at the time I need it	**This item was Incorporated in the item 2.**
7- I am unsure about how to measure the results of my own clinical practice.	**This item was excluded.**
8- I am sure that implementing Evidence Based Health (SBE) improves my clinical or professional practice.	8- I am sure that implementing Evidence Based Health improves my clinical or professional practice.
Attitude	
9- I often use research evidence to support my clinical decisions.	9- I use research evidence to support my clinical decisions
10- I ask colleagues for help in searching the scientific literature to find answers to my clinical questions.	10- I ask colleagues for help in consulting the scientific literature to find answers to my clinical questions.
11- When the research evidence does not support my reliable clinical routines, I feel uncomfortable.	11- I feel uncomfortable when research evidence does not support my clinical or professional practices.
12- I prefer to use my own experience to make my clinical decisions.	12- I prefer to use my own experience to make my clinical decisions.
13- I rarely look for available research evidence to answer my daily clinical question.	**This item was excluded.**
14- I frequently, at least twice a week, access evidence provided by Cochrane	**This item was excluded.**
Behavior	
15- I use the EBP because my peers do.	15- I adopt the EBP because my peers do.

16- I don't use EBP because it's hard to change my practice.	16- It is difficult to change my practice to use EBP.
17- EBP makes me feel autonomous in my clinical decisions	17-EBP makes me feel confident in my clinical decisions
18- I feel that SBE disregards my clinical experience.	18- I feel that EBP considers my clinical or professional experience.
19- I don't use EBP because I don't have time.	19- I don't use EBP because I don't have time.
20- I feel that EBP worsens the quality of my clinical decisions.	20- I feel that EBP worsens the quality of my clinical decisions.
21- I do not use EBP in my clinical practice for another reason (please specify).	21- I do not use EBP in my clinical practice for another reason (please specify).
Results/Benefits to the patient	
22- How much has the use of the **EBP** affected patient outcomes?	22- The EBP positively affects the health outcomes of the patient under my care.
23- How much has the use of the **EBP** practice affected your clinical decisions?	23 - The EBP positively affects my clinical decisions
24- How often does new research evidence result in a change in your practice?	24 - New research evidence results in change in my practice.
25- The institution where I work (in cases of working in two institutions, answer considering the one that devotes the most hours) has already implemented EBP.	**This item has been changed to characterization of professional practice.**
	32.The EBP provides a shared decision-making with the person under my care
	33. The EBP increases the satisfaction of the person under my care.
Knowledge/Skills	
26- Clinical trials and observational methods are equally valid in establishing the effectiveness of a treatment.	26- Randomized controlled trials and observational studies are equally valid in determining the effectiveness of a treatment.
27- Publication bias (Funel plot) in a meta-analysis represents selection bias	27-Publication bias in a meta-analysis represents selection bias.
28- Randomization in a clinical trial helps to reduce sample size.	28- Randomization in a clinical trial helps to reduce sample size.
29- Cross-sectional studies are the best designs to assess prognostic factors.	29- Cross-sectional studies are the best designs to assess prognostic factors.
30- A recent randomized clinical trial found that 29% of diabetics with coronary heart disease treated with	30- A recent randomized clinical trial found that 29% of diabetics with coronary heart

pravastatin had a recurrent coronary event during five years of follow-up. Whereas, in the placebo group, 37% suffered recurrent coronary events. The absolute risk reduction for recurrent events is 8%. The relative risk reduction for recurrent events is 22%. The number needed to treat to prevent a recurrent event is 12.5.	disease treated with pravastatin had a recurrent coronary event during five years of follow-up. Whereas, in the placebo group, 37% suffered recurrent coronary events. The absolute risk reduction for recurrent events is 8%. The relative risk reduction for recurrent events is 22%. The number needed to treat to prevent a recurrent event is 12.5.
31- The recent HERS study compared women using estrogen replacement hormone versus women using a placebo. The results revealed a relative risk of thromboembolic events of 2.89 for women who used estrogen. This suggests that estrogen treatment poses a coronary risk. For this difference to be statistically significant, the confidence interval must be checked. An example of a confidence interval that would lead us to conclude that the rate of venous thromboembolic events was indeed (statistically) different for these two treatment groups would be something that encompasses 2.89 and includes the 1.0 within the interval.	31- The recent HERS study compared women using estrogen replacement hormone versus women using a placebo. The results revealed a relative risk of thromboembolic events of 2.89 for women who used estrogen. This suggests that estrogen treatment poses a coronary risk. For this difference to be statistically significant, the confidence interval must be checked. An example of a confidence interval that would lead us to conclude that the rate of venous thromboembolic events was indeed (statistically) different for these two treatment groups would be something that encompasses 2.89 and includes the 1.0 within the interval.
Characterization of professional practice	
	25- The institution where I work (in cases of working in two institutions, answer considering the one that devotes the most hours) has already implemented EBP.
	34- Check the options that reflect your challenges to implement SBE practices (select the three most important options) ( ) There is no culture of SBE practice in my workplace ( ) Insufficient evidence for many everyday health problems ( ) Lack of institutional support ( ) Lack of time ( ) Lack of access to information source

	35.In my practice I use clinical protocols developed by (Select the possible options): ( ) Ministry of Health ( ) Brazilian Scientific Societies ( ) International Guidelines (eg: NICE) ( ) By the Hospital, Institute or place where I work ( ) By myself, based on readings from scientific studies and my background ( ) I do not use protocols in my practice
	36- Below are some terms related to the presentation of the results of clinical investigations. Please, check your degree of familiarity with the following terms:
	37- There are several platforms available aimed at EBP. Please, check your degree of familiarity with the following platforms:

APPENDIX 3 - FINAL INSTRUMENT - PORTUGUESE VERSION

I-SABE

Autoconfiança

Por favor, circule a resposta mais apropriada:	Concordo plenamente	Concordo	Concordo parcialmente	Neutro	Discordo parcialmente	Discordo	Discordo plenamente
1. Eu sou capaz de incorporar na minha prática a evidência proveniente da literatura científica.	7	6	5	4	3	2	1
2. Eu sou capaz de acessar (buscar em bases eletrônicas, usando estratégias de busca e encontrar) as melhores evidências da literatura científica, no tempo que necessito delas.	7	6	5	4	3	2	1
3. Eu sou capaz de avaliar criticamente a evidência proveniente da literatura científica.	7	6	5	4	3	2	1
4. Eu sou capaz de manter-me atualizado em relação às evidências.	7	6	5	4	3	2	1
5. Estou certo de que a implementação da Saúde Baseada em Evidência (SBE) melhora minha prática clínica ou profissional	7	6	5	4	3	2	1

Atitudes

Por favor, circule a resposta mais apropriada	Concordo plenamente	Concordo	Concordo parcialmente	Neutro	Discordo parcialmente	Discordo	Discordo plenamente
6. Eu uso as evidências provenientes de pesquisa para apoiar as minhas decisões clínicas.	7	6	5	4	3	2	1
7. Eu peço ajuda aos colegas na consulta à literatura científica para encontrar respostas às minhas perguntas clínicas.	7	6	5	4	3	2	1
8. Eu me sinto desconfortável quando as evidências de pesquisa não sustentam minhas práticas clínicas ou profissionais.	7	6	5	4	3	2	1

Comportamento

Por favor, circule a resposta mais apropriada: atitude	Concordo plenamente	Concordo	Concordo parcialmente	Neutro	Discordo parcialmente	Discordo	Discordo plenamente
9. Eu adoto a prática da SBE porque meus colegas o fazem.	7	6	5	4	3	2	1
10. É difícil mudar a minha prática para usar a SBE	7	6	5	4	3	2	1
11. A SBE me faz sentir confiante em minhas decisões clínicas	7	6	5	4	3	2	1
12. Eu não uso SBE porque eu não tenho tempo	7	6	5	4	3	2	1
13. Eu sinto que a SBE piora a qualidade das minhas decisões clínicas.	7	6	5	4	3	2	1
14. Eu sinto que a SBE considera minha experiência clínica ou profissional.	7	6	5	4	3	2	1
15. Eu não adoto a prática da SBE por outra razão (especifique):							

Resultados/Benefícios para o paciente

Por favor, circule a resposta mais apropriada:	Completamente	Muito	Moderadamente	Mais ou menos	Um pouco	De nenhum modo
16. A prática da SBE afeta positivamente minhas decisões clínicas.	6	5	4	3	2	1
17. A prática da SBE afeta positivamente os resultados em saúde da pessoa sob meus cuidados.	6	5	4	3	2	1
18. Novas evidências de pesquisa resultam em mudança na minha prática.	6	5	4	3	2	1
19. A prática da SBE propicia uma tomada de decisão compartilhada com a pessoa sob meus cuidados.	6	5	4	3	2	1
20. A prática da SBE aumenta a satisfação da pessoa sob meus cuidados.	6	5	4	3	2	1

Conhecimento/Habilidades

Por favor, assinale a resposta mais apropriada:	Correto	Incorreto	Não sei
21. Ensaios clínicos controlados, randomizados e os estudos observacionais são igualmente válidos na determinação da efetividade de um tratamento.			
22. Viés de publicação em uma metanálise representa viés de seleção.			
23. A randomização em um ensaio clínico ajuda a reduzir o tamanho amostral.			
24. Estudos transversais são os melhores delineamentos para avaliar fatores prognósticos.			
25. Um recente ensaio clínico randomizado descobriu que 29% dos diabéticos com doença coronariana tratados com pravastatina, apresentaram evento coronariano recorrente durante cinco anos de seguimento. Enquanto que, no grupo placebo, 37% sofreram eventos coronarianos recorrentes. A redução absoluta do risco para eventos recorrentes é 8%. A redução do risco relativo para eventos recorrentes é 22%. O número necessário para tratar para prevenir um evento recorrente é 12,5.			
26. O estudo recente HERS comparou mulheres que utilizam reposição hormonal com estrogênio versus mulheres que utilizaram placebo. Os resultados revelaram um risco relativo de eventos tromboembólicos de 2,89 para as mulheres que usaram estrogênio. Isso sugere que o tratamento com estrogênio representa risco coronariano. Para que esta diferença seja estatisticamente significante, deve-se verificar o intervalo de confiança. Um exemplo de intervalo de confiança que nos levaria a concluir que a taxa de eventos tromboembólicos venosos foi de fato (estatisticamente) diferente para estes dois grupos de tratamento seria algo que englobe 2,89 e inclui o 1,0 dentro do intervalo.			

Caracterização da prática professional

27 . Marque as opções que traduzem os seus desafios para implementar as práticas da SBE (selecione as três opções mais importantes)
( ) Não existe cultura da prática da SBE em meu local de trabalho
( )Evidências insuficientes para muitos dos problemas de saúde cotidianos
( ) Falta de apoio institucional
( ) Falta de tempo
( ) Falta de acesso às fontes de informação

( ) Método complexo de aprender e de dominar
( ) Não tenho dificuldades para tomar decisões de acordo com os fundamentos propostos pela prática da SBE
( ) **Nenhuma das anteriores, pois não utilizo a prática da SBE.**

28 . **Na minha prática utilizo protocolos clínicos elaborados por (Selecione as opções possíveis):**
( ) Ministério da Saúde
( ) Sociedades Científicas Brasileiras
( ) *Guidelines* Internacionais (ex.: NICE)
( ) Pelo Hospital, Instituto ou local que trabalho
( ) Por mim mesmo, com base em leituras de estudos científicos e meu *background*
( ) Não utilizo protocolos na minha prática

29.Abaixo estão alguns termos relacionados com a apresentação dos resultados das investigações clínicas.

Marque o seu grau de familiaridade com os mesmos.	**Eu entendo e utilizo**	**Eu entendo mas não utilizo**	**Eu não entendo**
Revisão sistemática			
Metanálise			
Intervalo de confiança			
Grade			
Odds ratio, Risco relativo, Risco absoluto			
Número de pacientes necessários para tratar (NNT)			
Razão de verossimilhança (likelihood ratio)			

30. Existem vários recursos disponíveis voltados para as práticas da SBE.

Informe as plataformas que você já consultou.	**Não conheço**	**Conheço mas nunca utilizei**	**Conheço e utilizei apenas algumas vezes**	**Conheço e utilizo regularmente na minha prática**
Cochrane Library (ou Cochrane plus ou Biblioteca Cochrane)				
UptoDate				
Pubmed				
Trip Database				
Dynamed				
Scielo				

BMJ Best Practice				
NICE Clinical Guidelines				
Biblioteca Virtual em Saúde (BVS)				
Portal Saúde Baseada em Evidências do Ministério da Saúde				
Health Systems Evidence e Health Evidence				
Outro (especifique:				

31. Por favor, circule a resposta mais apropriada	**Concordo plenamente**	**Concordo**	**Concordo parcialmente**	**Neutro**	**Discordo parcialmente**	**Discordo**	**Discordo plenamente**
A instituição onde trabalho (nos casos de atuar em duas instituições, responda considerando aquela à qual dedica maior número de horas) implementa as práticas de SBE.	7	6	5	4	3	2	1

APPENDIX 4 - FINAL INSTRUMENT – ENGLISH VERSION

Self-efficacy

Please circle the most suitable answer:	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
1. I am able to incorporate evidence from the scientific literature into my practice.	7	6	5	4	3	2	1
2. I am able to access the best evidence from the scientific literature, in the time I need them.	7	6	5	4	3	2	1
3. I am able to critically assess evidence from the scientific literature.	7	6	5	4	3	2	1
4. I am able to keep up to date with the evidence.	7	6	5	4	3	2	1
5. I am sure that implementing EBP improves my clinical or professional practice	7	6	5	4	3	2	1

Attitude

Please circle the most suitable answer:	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
6. I use research evidence to support my clinical decisions.	7	6	5	4	3	2	1
7. I ask colleagues for help in consulting the scientific literature to find answers to my clinical questions.encontrar respostas às minhas perguntas clínicas.	7	6	5	4	3	2	1
8. I feel uncomfortable when research evidence does not support my clinical or professional practices.	7	6	5	4	3	2	1

Behavior

Please circle the most suitable answer:	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
9. I adopt the EBP because my peers do.	7	6	5	4	3	2	1
10. It is difficult to change my practice to use EBP.	7	6	5	4	3	2	1
11. EBP makes me feel confident in my clinical decisions	7	6	5	4	3	2	1

12. I feel that EBP worsens the quality of my clinical decisions.	7	6	5	4	3	2	1
13. I feel that EBP considers my clinical or professional experience.	7	6	5	4	3	2	1
14. I do not use EBP because I don't have time.	7	6	5	4	3	2	1
15. I do not use EBP in my clinical practice for another reason (please specify).							

Results/Benefits to the patient

Please circle the most suitable answer:	**Strongly Agree**	**Agree**	**Somewhat Agree**	**Neutral**	**Somewhat Disagree**	**Disagree**
16. The EBP positively affects my clinical decisions	6	5	4	3	2	1
17. The EBP positively affects the health outcomes of the patient under my care.	6	5	4	3	2	1
18. New research evidence results in change in my practice.	6	5	4	3	2	1
19. The EBP provides a shared decision-making with the person under my care	6	5	4	3	2	1
20. The EBP increases the satisfaction of the person under my care.	6	5	4	3	2	1

Knowledge/Skills

Please tick (√) the most appropriate option	**Correct**	**Incorrect**	**I do not Know**
21. Randomized controlled trials and observational studies are equally valid in determining the effectiveness of a treatment.			
22. Publication bias in a meta-analysis represents selection bias.			
23. Randomization in a clinical trial helps to reduce sample size.			
24. Cross-sectional studies are the best designs to assess prognostic factors.			
25. A recent randomized clinical trial found that 29% of diabetics with coronary heart disease treated with pravastatin had a recurrent coronary event during five years of follow-up. Whereas, in the placebo group, 37% suffered recurrent coronary events. The absolute risk reduction for recurrent events is 8%. The relative risk reduction for recurrent events is 22%. The number needed to treat to prevent a recurrent event is 12.5.			
26. The recent HERS study compared women using estrogen replacement hormone versus women using a placebo. The results revealed a relative risk of thromboembolic events of 2.89 for women who used estrogen. This suggests that estrogen treatment poses a coronary risk. For this difference to be statistically significant, the confidence interval must			

be checked. An example of a confidence interval that would lead us to conclude that the rate of venous thromboembolic events was indeed (statistically) different for these two treatment groups would be something that encompasses 2.89 and includes the 1.0 within the interval.			

Characterization of professional practice

27 . Check the options that reflect your challenges to implement EBP (select the three most important options)

( ) There is no EBP culture in my workplace
( ) Insufficient evidence for many health problems
( ) Lack of institutional support
( ) Lack of time
( ) Lack of access to information sources
( ) Complex method of learning and mastering
( ) I have no difficulties in making decisions according to the fundamentals proposed by the EBP.
( ) None of the above, I do not use the EBP

28 . In my practice I use clinical protocols developed by (Select the possible options):

( ) Ministry of Health
( ) Brazilian Scientific Societies
( ) International Guidelines (ex.: NICE)
( ) Hospital, Institute or place where I work
( ) By myself, based on readings from scientific studies and my background
( ) I don't use protocols in my practice

29. Below are some terms related to the presentation of the results of clinical investigations.

Please, check your degree of familiarity with the following terms:	I understand and use	I understand but I don't use	I do not understand
Systematic review			
Meta-analysis			
Confidence interval			
Grade			
Odds ratio, Relative risk, Absolute risk			

Number of patients needed to treat (NNT)			
Likelihood ratio			

30. There are several platforms available aimed at EBP

Please, check your degree of familiarity with the following platforms:	I don't know	I know but I've never used it	I know and I've only used it a few times	I know and use it regularly in my practice
Cochrane Library (ou Cochrane plus ou Biblioteca Cochrane)				
UptoDate				
Pubmedyu				
Trip Database				
Dynamed				
Scielo				
BMJ Best Practice				
NICE Clinical Guidelines				
Biblioteca Virtual em Saúde (BVS)				
Portal Saúde Baseada em Evidências do Ministério da Saúde				
Health Systems Evidence e Health Evidence				
Outro (especifique)_____				

31. Please circle the most suitable answer:	Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Agree
The institution where I work (in the case of working in two institutions, answer considering the one to which you dedicate the most hours) implements EBP..	7	6	5	4	3	2	1

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	Title page
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	4 - 7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5-7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Not appicable
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*5- 10*
Bias	9	Describe any efforts to address potential sources of bias	5- 10
Study size	10	Explain how the study size was arrived at	6 and 9
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7 and 10
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7 and 10
		(*b*) Describe any methods used to examine subgroups and interactions	Not applicable
		(*c*) Explain how missing data were addressed	Not applicable
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	7, 10
		(*e*) Describe any sensitivity analyses	10
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Figure 3 and page 13
		(b) Give reasons for non-participation at each stage	Figure 3 and page 13
		(c) Consider use of a flow diagram	Figure3 and page 13
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Table 1 and page 13

		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	Table 2-5, page 11-13
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Table 2-5 page 11-13
		(*b*) Report category boundaries when continuous variables were categorized	Not applicable
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not applicable
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Not applicable
Discussion			
Key results	18	Summarise key results with reference to study objectives	14-16
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14-16
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	14-16
Generalisability	21	Discuss the generalisability (external validity) of the study results	14-16
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Not applicable

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.