KNOWLEDGE, SKILLS AND ATTITUDES REQUIRED BY STUDENTS TO APPLY GOOD PRACTICE BASED ON EVIDENCE

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ABSTRACT

Objective: to identify the Knowledge, Skills and Attitudes necessary for an Evidence-Based Practice of Excellence.

Method: This research was conducted following the principles of an integrative literature review. Data collection was carried out based on the selection of scientific articles published on the platforms of the Virtual Health Library and the National Library of Medicine and the National Institutes Health, including full text articles, in Portuguese, English and Spanish, being published in the last 10 years, the Health Sciences Descriptors “Evidence-Based Practice” being “students” and “health”, which were crossed with the Boolean operator AND. Finally, I selected 15 surveys.

Results/Discussion: The majority of studies presented were produced in 2021 (33%; n = 5) and the language was predominantly English (73%; n = 11). Furthermore, competencies are agreed, namely knowledge, skills and attitudes involved in the EBP development process. The main knowledge is mastering the stages of scientific investigation, critically interpreting literature, basic use of information technology and applying the knowledge acquired in cases individual. When referring to skills, it is necessary to take into cultural consideration the environment in which this practice is being carried out, in addition to the ability to communicate in other languages and computer skills. The most important attitudes include the student's particular interest in participating and improving in the scientific field, in addition to applying evidence.

Conclusion: The identification of the skills necessary to apply EBP is necessary to guarantee a solid foundation before carrying out such practice in the community, which will guarantee better health for the population in the

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long term, in addition to promoting technical and practical improvement for students and professionals who produce them.

**Keywords:** Evidence-Based Practice, Skills, Knowledge.

**CONHECIMENTOS, HABILIDADES E ATITUDES NECESSÁRIOS AOS ESTUDANTES PARA APLICAÇÃO DE UMA BOA PRÁTICA BASEADA EM EVIDÊNCIAS**

**ABSTRACT**

**Objetivo:** Identificar quais são os Conhecimentos, Habilidades e Atitudes necessários para uma Prática Baseada em Evidências de excelência.

**Método:** Esta pesquisa foi conduzida seguindo os princípios de uma revisão integrativa de literatura. A coleta de dados foi realizada a partir da seleção de artigos científicos publicados nas plataformas da Biblioteca Virtual em Saúde e National Library of Medicine and the National Institutes Health, incluindo artigos com texto completo, nos idiomas português, inglês e espanhol, sendo publicados nos últimos 10 anos, sendo os Descritores em Ciências da Saúde “Evidence-Based Practice” “students” e “health”, os quais foram cruzados com o operador booleano AND. Por fim, selecionaram-se 15 pesquisas.

**Resultados/Discussão:** A maioria dos estudos observados foram produzidos no ano de 2021 (33%; n = 5) e o idioma predominante o inglês (73%; n = 11). Ademais, identificou-se as competências, sendo elas conhecimentos, habilidades e atitudes envolvidas no processo de desenvolvimento da PBE. Os principais conhecimentos são domínio das etapas da investigação científica, interpretar criticamente a literatura, uso básico de informática e aplicar o conhecimento adquirido em casos individuais. Ao que se refere às habilidades, é necessário reconhecer culturalmente o ambiente em que se está empregando tal prática, além de capacidade de comunicação em outras línguas e habilidades em informática. Já as atitudes mais importantes, detêm-se ao interesse particular do estudante para participar e melhorar no âmbito científico, além da aplicação de evidências.

**Conclusão:** A identificação das competências necessárias para aplicar a PBE é imprescindível para garantir uma base sólida antes de executar tal prática na comunidade, o que irá garantir uma melhor saúde para a população ao longo prazo, além de promover uma melhora técnica e prática aos estudantes e profissionais que as produzem.

**Palavras-chave:** Prática Baseada em Evidências, Competências, Conhecimento.

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**1 INTRODUCTION**

The Evidence-Based Practice is the correlation between the best scientific evidence existing with practical experience, along with individual values and preferences, such as expectations, cultural influences and other peculiarities (Albarqouni; Hoffmann; Glasziou, 2018). The decisions ð are based, nCORo only by experience and perceptions ço professionals, but also on results of good quality scientific studies (Almeida et al., 2016). Therefore, it is clear that PBE is an indispensable practice in the health sciences, because if properly applied, they have the possibility of potentializing the improvement of the living condition for several patients, besides improving the health system as a whole.

"The paradigm has been gaining ç in the most diverse fields" (Almeida et al., 2016, p. 68). In addition, competencies in PBE are very important for there to be an efficient applicability of this practice, to carry it out, it is necessary that professionals have aptitude in the five main domains that the PBE is based, and they are composed of: search for correct and well defined information, research in the literature, critical reasoning, integration of evidence
and self-reflection. In addition, some essential concepts of PBE are correlated with these domains, being knowledge, skill and attitude, which are extremely important for the realization of the five steps indispensable for clinical application in practice (Howard; Diug; Ilic, 2022).

The implementation of this very effective practice, especially in health care, considered as the main response to several health problems, such as inefficiency, lack of safety for the patient and quality of service. Therefore, due to the importance of this practice, it is necessary to introduce this topic in the academic training environment, aiming at the correct professional preparation in this form of scientific updating of practices, to avoid consultations of incoherent theories and of low relevance, besides preparing in advance and with a superior quality, which will result in a more efficient professional in the application of the PBE in the future (Aglen, 2016).

On the other hand, although it is necessary to apply this theme in the student and professional environment, teaching PBE is not easy, since when trying to apply all components, due to the need for incorporation by students of all stages of the PBE model, along with the obstacle of short deadlines and short time-span for delivery of evidence-mediated interventions, lack of ideal support for students and theoretical framework suitable for PBE development (Ramis et al., 2019).

Therefore, it is necessary to analyze and identify the competencies for producing PBE present in current students, so that there can be a targeting and individualization of PBE teaching, especially as regards knowledge, skills and attitudes, in order to identify a pattern that is evident for improving the future applicability of PBE in health.

This article seeks to highlight what knowledge, skills and attitudes are needed to conduct an Evidence-Based Practice with excellence, blending its collaboration with the scientific community with the objective of systematizing, grouping and interpreting the varied studies selected on this theme, making available a theoretical apparatus on the main competencies that are indispensable for the production of PBE with quality.

2 METHODOLOGY

This research was conducted following the principles of an integrative literature review. This method of qualitative systematic review, seeks to synthesize, bring together, analyze and criticize research, making possible the combination of distinct methodologies, bringing even more precision for the implementation of the six steps, being: definition of the guiding question, selection of the search tools, pre-selection and selection of the studies, organization and categorization of the results of the trialed articles, analysis and interpretation of the results and synthesis of knowledge. In addition, it provides an opportunity to search for and carefully analyze the available evidence related to the topic of the study, culminating in the updating of the existing knowledge on the subject in question (Sousa; Bezerra; Egypto, 2023).

Initially, in the present study, the guiding question was established as "What knowledge and skills are needed for the application of a good Evidence-Based Practice among students?". Subsequently, the Health SciencesDescriptors (DeCS) "Evidence-Based Practice" "students" and "health" were validated, which were cross-referenced with the Boolean operator. Based on this strategy, the research was organized from navigation on the platforms of the Virtual Library on Health (VHL) and National Library of Medicine and the National Institutes Health (PUBMED). For greater precision of the results, the inclusion criteria were instituted: articles, full text available, language (English, Portuguese and Spanish) and publications in the last ten years. As for the exclusion criteria, articles with thematic incompatibility and repeated.

Consequently, after the insertion of DeCS in the platforms, the bibliographic survey made it possible to identify 1182 articles in the VHL and already 1435 in the PUBMED were found 1428 articles. After the use of the inclusion criteria, 828 articles from the VHL and 1024...
from PUBMED were pre-selected. However, with the exclusions, the sample consisted of 15 publications (Figure 1).

**Figure 1:** Article Selection Process  
**Source:** Database search, 2023.

In the categorization process, the variables analyzed in the first table were: title, author and year. In the second table, though, the studies were divided according to the competencies of a PBE - knowledge, ability and attitude - being the result of this table, intended to answer the question that guides the study in question. Next, the results went through a scientific analysis for the synthesis of knowledge proposed by the research.

**3 RESULTS**

In Table 1, it is possible to analyze that of the 16 categorized articles, the majority were published in 2021 (33%; n = 5). Furthermore, it was observed that the most prevalent language was English (73%; n = 11).
Table 1: Selected Articles on the Experience of Evidence-Based Practice

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors(year)</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-based practice in radiology: Knowledge, attitude and perceived barriers to practice among residents in radiology</td>
<td>Anuradha et al. (2013)</td>
<td>English</td>
</tr>
<tr>
<td>Knowledge, attitude, and barriers towards the use of evidence-based practice among senior dental and medical students in western Saudi Arabia.</td>
<td>Bahammam and Linjawi (2014)</td>
<td>English</td>
</tr>
<tr>
<td>Promoting evidence-based practice: training health professionals</td>
<td>Cardoso et al. (2021a)</td>
<td>English and Portuguese</td>
</tr>
<tr>
<td>The Effectiveness of an Evidence-Based Practice (EBP) Educational Program on Undergraduate Nursing Students' EBP Knowledge and Skills: A Cluster Randomized Control Trial</td>
<td>Cardoso et al (2021b)</td>
<td>English</td>
</tr>
<tr>
<td>Core Evidence-Based Practice Competencies and Learning Outcomes for European Nurses: Consensus Statements</td>
<td>Dolezel et al. (2021)</td>
<td>English</td>
</tr>
<tr>
<td>Rwandan nursing students' knowledge, attitudes and application of evidence-based practice</td>
<td>Iradukunda and Mayers (2020)</td>
<td>English</td>
</tr>
<tr>
<td>Korean Nursing Students' Acquisition of Evidence-Based Practice and Critical Thinking Skills</td>
<td>Kim et al. (2018)</td>
<td>English</td>
</tr>
<tr>
<td>A Multicountry Study on Nursing Students' Self-Perceived Competence and Barriers to Evidence-Based Practice.</td>
<td>Labrague et al. (2019)</td>
<td>English</td>
</tr>
<tr>
<td>Knowledge, skills, and attitudes of nursing students on evidence-based practice</td>
<td>Myakava, Santos and Püschel (2021)</td>
<td>English and Portuguese</td>
</tr>
<tr>
<td>Evidence-based practice competence in undergraduate Nursing Degree students.</td>
<td>Ruzafa-Martínez, Molina-Salas and Ramos-Morcillo (2016)</td>
<td>English and Spanish</td>
</tr>
<tr>
<td>Knowledge, skills and attitudes related to evidence-based practice among undergraduate nursing students: A survey at three universities in Colombia, Chile and Spain</td>
<td>Sánchez-García et al. (2019)</td>
<td>English</td>
</tr>
<tr>
<td>Evidence-based physical therapy: level of knowledge of private network academics in Salvador - BA</td>
<td>Santos et al. (2018)</td>
<td>Portuguese</td>
</tr>
<tr>
<td>What Should Be Considered in the Evidence-Based Practice Competency-Based Curriculum for Undergraduate Nursing Students? From the Student's Point of View.</td>
<td>Song, Kim and Park (2021)</td>
<td>English</td>
</tr>
<tr>
<td>Predictors of evidence-based practice competency among Tunisian nursing students</td>
<td>Tlili et al. (2022)</td>
<td>English</td>
</tr>
<tr>
<td>Evidence based practice competence of future traditional Chinese medicine nurses: A cross-sectional online study</td>
<td>Zhou, Lv and Zhao (2022)</td>
<td>English</td>
</tr>
</tbody>
</table>


Table 2 categorizes the studies based on the competencies required to produce a quality PBE, which are Knowledge, Skills and Attitudes. Statistical analyzes of which more apparent skills were not possible due to the subjectivity employed by each author to describe each ideal aspect needed.
Table 2: Approach to what Knowledge, Skills and Attitudes are involved in PBE

<table>
<thead>
<tr>
<th>Authors (Year)</th>
<th>Knowledge</th>
<th>Skills</th>
<th>Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anuradha <em>et al.</em> (2013)</td>
<td>Awareness of evidence-based medicine sources, access to Medline at work</td>
<td>Use of evidence-based summaries</td>
<td>Attitude with colleagues, type of colleague, use of protocols produced by research companions</td>
</tr>
<tr>
<td>Bahammam and Linjawi (2014)</td>
<td>Course attendance, periodical reading and knowledge of the strongest evidence for PBE</td>
<td>Critical thinking, analysis, clinical experience, teamwork and interprofessional skills</td>
<td>Interest in acting with PBE</td>
</tr>
<tr>
<td>Cardoso <em>et al.</em> (2021a)</td>
<td>Know the different determinants of each population that will be studied.</td>
<td>Mastering cultural bias, communication capacity and collaboration in the clinical context.</td>
<td>Ability to adapt to a multifaceted clinical context.</td>
</tr>
<tr>
<td>Cardoso <em>et al.</em> (2021b)</td>
<td>Concrete understanding in the area of activity and in the area of scientific research, to apply the evidence in the clinical environment in a contextualized manner.</td>
<td>Structuring guiding questions, searching for and retrieving evidence; critically assessing evidence for clinical validity and importance; applying evaluated evidence to practice; and evaluating performance.</td>
<td>Institutional incentive, to include courses, teaching strategies and training that focus on developing research and PBE skills.</td>
</tr>
<tr>
<td>Dolezel <em>et al.</em> (2021)</td>
<td>Contextualize the care of a particular patient, group, or community.</td>
<td>Ask clinically relevant questions for purposes of acquisition, evaluation, application of evidence.</td>
<td>Ability to research and apply scientific evidence at all academic stages.</td>
</tr>
<tr>
<td>Iradukunda and Mayers (2020)</td>
<td>Handle clinical experience with search results.</td>
<td>Develop appropriate research questions, critically research and evaluate relevant literature, and assess the transferability of research evidence to clinical practice</td>
<td>Ability to research and apply evidence from the early stages of their academic training</td>
</tr>
<tr>
<td>Labrague <em>et al.</em> (2019)</td>
<td>Understand the basics of PBE.</td>
<td>Formulate a question, seek the best evidence for the answer of the clinical question, apply the results found and evaluate their impact in the context</td>
<td>Provide the necessary relevance and usefulness to PBE</td>
</tr>
<tr>
<td>Myakava, Santos and Püschel (2021)</td>
<td>Theoretical understanding of research, informatics and literature interpretation skills and application to individual cases</td>
<td>To identify and assess skills relevant to the implementation of the EBP.</td>
<td>Cultivate a questioning attitude.</td>
</tr>
<tr>
<td>Ruzafa-Martínez, Molina-Salas and Ramos-Morcillo (2016)</td>
<td>Understanding and raising awareness of the principles and concepts of PBE</td>
<td>Critically evaluate the evidence, integrate the evidence into clinical practice, and evaluate the consequences of implementing the chosen interventions</td>
<td>Positive attitude influences your willingness to adopt and implement evidence-based interventions in your clinical practice</td>
</tr>
<tr>
<td>Authors</td>
<td>Task(s) Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sánchez-García <em>et al.</em> (2019)</td>
<td>A solid understanding of the specific area of activity, in the area of health, is fundamental for applying a PBE. Apply pedagogical techniques to increase teachers’ understanding, participation and level of commitment to PBE, and measure the effectiveness of educational programs. Institutional incentives, such as providing opportunities for students to take part in clinical research projects, using technologies and simulations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Santos <em>et al.</em> (2018)</td>
<td>Identify journals for publication, databases, article selection parameters, journals and adequate scientific production. Obtain, interpret and integrate research evidence with the actual clinical situation of the patient.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Song, Kim and Park (2021)</td>
<td>Present a certain clinical knowledge on the subject studied. Mastering dynamic reading techniques, good communication, ability to work as a team, develop critical and creative thinking.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhou, Lv and Zhao (2022)</td>
<td>Theoretical understanding of the development of PBE in Traditional Chinese Nursing. Integrate the best available research evidence with clinical experience and context in decision making.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Research data, 2023.

### 4 DISCUSSION

Evidence-based practice is recognized as the key to improving the quality of healthcare. This practice consists of making clinical decisions that take into consideration the best available evidence, the context of care, the patient's autonomy, and the discernment of the healthcare professional. Thus, it avoids insecure/inefficient practices and improves the quality of care. In addition, this practice structures the conduct, without replacing the clinical judgment of the professional, taking into account the personal experience of the healing process. It is believed that, in the absence of practical experience, even high-quality evidence may be inadequate in real contexts (Sousa, 2016; Schneider; Pereira; Ferraz, 2020; Cardoso *et al.*, 2021a).

This methodology is seen as the best indication for providing person-centered care safely and effectively, as evidence-based practice favors early implementation of more advanced treatments or results in rejection of ineffective treatments. Healthcare professionals and students need knowledge to understand the processes that involve scientific research, and thus provide evidence-based care practices. However, many health students find research methods difficult to understand and do not see how research could enable them to provide the best care to their patients (Bahammam; Linjawi, 2014; Hemingway *et al.*, 2022; Kumah et al., 2022).

However, its implementation faces challenges arising from gaps in research and practical implementation. In addition, health professionals and students continue to encounter difficulties in their implementation, although the models for their implementation offer step-by-step approaches, effective and consistent implementation encounters obstacles due to elements such as the context of care and the mechanistic nature of the process (Kumah *et al.*, 2022).
Other variables that imply obstacles to the implementation of this approach are the absence of prior knowledge about PBE, inabilities to its application, lack of belief in the effectiveness of PBE as a superior method, time load that makes it difficult to search resources, evaluation of available evidence, insufficient working time to apply new evidence, inability to understand statistical methods, non-compaction of the relevant literature in one place, besides little administrative support or encouragement from institutions for the development of this method (Anuradha et al., 2013; Schneider; Pereira; Ferraz, Pereira; Ferraz, Ferraz, 2013). (2)

Therefore, it is known that PBE has structured a new model for the medical approach, introducing new initiatives to guide this practice, including the systematic observation of clinical experience, the use of critical thinking focused on the effectiveness of treatment and a correct interpretation of the literature, so its importance is established (Myakava; Santos; Puschel, 2021).

The first stages of the PBE process require students to search for evidence and interpret it, understanding it as competencies of the bachelor's level. These competencies are knowledge in research and informatics, skills to interpret literature and apply it to individual cases, fundamental to PBE and attitude of students in engaging with the problem. Of these points, knowledge and ability are the most fragile for students of the first periods, therefore it is understood that it is up to institutions to provide this first contact with the theme, fostering the need to provide adequate care to health users that are based on the best available evidence. To this end, the integration of PBE into the curriculum is strongly recommended since the beginning of the career (Myakava; Santos; Puschel, 2021).

In order for this method of study to be put into practice efficiently, it is necessary to master competencies such as: knowledge, skills and attitudes. In the first instance, focusing on knowledge, we highlight: knowledge about the process of scientific research, description of the levels of evidence, basic computer handling, expertise for critical interpretation of the literature and application to individual cases, understanding of the basic concepts of PBE, formulation of structured clinical questioning, identifying the quality of journals for publication, recognition and search in databases, parameters for selection of articles, journals and adequate scientific production, evaluating knowledge in the context of the care of a given patient, group or community (Santos et al., 2018; Labrague, 19; Dolezel. et al., 2021; Myakava; Santos; Püschel, 2021).

In addition to this, it is the skills that make this methodology a possible practice: translating uncertainty into a question that can be answered; critically evaluating evidence as to clinical validity and importance; applying the evidence evaluated to clinical conduct; mastering other languages, such as English; recognizing the cultural bias in the healthcare environment, communication and collaboration skills; computer skills; developing critical thinking, enabling analysis, clinical experience, teamwork and interprofessional skills (Ruzafa-Martínez; Molina-Salas; Ramos-Morcillo, 2016; Kim et al., 2018; Cardoso

In addition, the importance of attitudinal bias for the implementation of this study model is established. For Iradukunda and Mayers (2020), it is the students’ responsibility to research and apply evidence from the early stages of their academic training. In addition to student responsibility, Cardoso et al. (2021b) stated that it should be the attitude of institutions to stimulate the application of this methodology through the inclusion of courses, teaching strategies and training, in the curriculum, in order for students to focus and believe in the effectiveness of PBE.

Accordingly, Sánchez-García et al. (2019) stressed the need to provide opportunities for the participation of these students in clinical research projects, in which the use of technologies and simulations is encouraged. During the course of the graduations, when compared the first years with the last, it was observed that attitude was the most impaired competence, decreasing its implementation, significantly (Zhou; Lv; Zhao. 2022).
Furthermore, it is known that in the aspect of attitudes that make up PBE is relevant to the management of the affective components, constituting the care, as when students show interest for the patients in all aspects of the health-disease process. The cultivation of a spirit of investigation about the clinical situation also characterizes an indispensable attitude, inquiry. Valuing its area of activity and adopting a positive position when understanding the need to implement PBE, are also trivial attitudes for this process (Song; Kim; Park, 2021).

It is necessary to be qualified and develop skills for critical and interpretative analysis as to current scientific production (Bachur; Sousa, 2022). There is an expectation that all these skills can be employed, providing opportunities for an improvement in the quality of PBE by generating new skills that allow health professionals and organizations to clarify performance expectations in relation to PBE. This includes concisely outlining the skills needed for successful application of the best evidence in daily care (Dolezel et al., 2021).

Consequently, the research presented as a limitation, studies with partial definitions of the three competencies that govern PBE, besides the unavailability of full texts of quality. However, the analysis of data in the light of literacy was possible, bringing the answer of the goal and the guiding question.

5 CONCLUSION

In summary, this review verified the key competencies required for the application of a quality Evidence-Based Practice by students, being divided between knowledge, skills and attitudes. It was understood that the necessary knowledge is diverse, but some are more notorious as: mastering the stages of scientific research, critically interpreting literature, basic use of informatics and applying the knowledge acquired in individual cases.

Furthermore, the most evident skills are communication in more than one language due to globalization and variety of languages where scientific content is being produced -, the previous point corroborates with the result found, due to 2/3 of the studies analyzed being in English. In addition, it is also important the ability to culturally recognize the environment in which this practice is employed, due to the particularities of each one that has to be respected and have at least basic aptitude in the area of information technology. In addition, the most important attitudes are the particular interest of the student to participate and improve in the scientific field, besides the application of evidence, which will facilitate their entry into research groups that can contribute positively to PBE.

Although scientific production grows exponentially, due to increased population access to higher education, the quality of studies does not grow proportionally. Therefore, the identification of the skills needed to apply PBE is indispensable to ensure a solid foundation before carrying out such a practice in the community, which will ensure better health for the population in the long term, as well as promoting a technical and practical improvement for students and professionals who produce them.

By linking all the points mentioned above, it will be possible to achieve an efficient competence on how to produce and apply a PBE and, with this, mitigate the backwardness and potentialize the quality in population care.

REFERENCES


