

## COMPETENCE- BASED ASSESSMENT TOOLS IN FAMILY AND COMMUNITY MEDICINE RESIDENCE: INTEGRATIVE REVIEW

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**Abstract: Goal:** Review articles that address different assessment tools and methods based on competences of the Resident Doctor in Family and Community Medicine.

**Methodology:** This is an integrative review with the following research question “What are the strategies, pointed out in the literature, for a competence-based assessment of the resident physician in Family and Community Medicine?”, with a search for references through the exploration of a database. Databases: *Publisher Medline* (PubMed) and Virtual Health Library (BVS), using the following descriptors and their combinations: “family medicine”, “residency”, “assessment” and “competency”. Articles published in the last 10 years, which had full text, in English and Portuguese, that related to the research topic were included.

**Result:** From a total of 6 articles, 4 different competency-based assessment methods were extracted and analyzed: 1- Clinical Assessment Mini-Exercise (Miniex), 2- Milestones, 3- Competency-Based Achievement System (CBAS), and 4- Entrustable Professional Activities (EPAs). **Conclusion:** Knowledge about these tools and their correct use enables an integral, complete and practical assessment of students, especially in a scenario where the need for competent assessment methods that accompany the advancement of competency-based curricula grows. These innovative assessment methods enable the Family and Community Medicine resident to actively participate in the teaching-learning process, making it evolve more consistently during the residency program.

**Keywords:** Medical Residency; Family and Community Medicine; Evaluation.

## INTRODUCTION

Medical education began in Brazil in the 19th century, with the inauguration of the first medicine course in Brazil - the Escola de Medicina e Cirurgia do Hospital Militar

da Bahia, in 1808. Until the 1930s, when the University of São Paulo, the teaching of medicine was based on practical tradition, with no scientific basis for the explanation of the phenomena studied. A new leap in evolution occurred in the 1950s, with the adoption of the North American model of Higher Education, which now integrates teaching and research. It is in this context that the Flexnerian model of medical, biomedical, individualistic, hospital-centered teaching expands as a hegemonic model. (MACHADO, WUO and HEINZLE, 2018).

The expansion of the teaching and practice model of Medicine around the world brought with it some problems. First, it increased care costs exponentially; in addition, it brought unsatisfactory results, since it was not concerned with intervening in the health determinants of populations. As a response to these problems, the Alma Ata Conference took place in 1978. (PAGLIOSA and DA ROS, 2008).

At that Conference, Primary Health Care was defended as a strategy to expand comprehensive health care for the entire world population, aiming at better results and lower costs. Then came the need to train a new medical professional, capable of dealing with a scenario of low technological density, extra-hospital, and high contextual complexity. This professional must be able to understand and intervene on health determinants, as well as provide comprehensive care to the most prevalent conditions in communities, regardless of gender or age. (CASTIEL, 2012).

In Brazil, the training of this new professional was also stimulated by the Family Health Program, in 1994, which used Primary Health Care as a model for universal health care. From the 1990s and 2000s onwards, various incentives were provided by the government, both the Ministry of Health and the Ministry of Education, to implement

changes in the Curriculum of Medicine. We went from a model divided into basic and clinical cycles to an integrated model, the Integrated Curriculum. (ALVES; SOUZA, ZEFERINO and DA ROS, 2011).

In this type of curriculum, students are exposed to practical situations from the beginning of the course. In relation to Primary Care, they are introduced in the environment of Health Units from the first period of the course, being subjected to learning scenarios consistent with the ability to do something appropriate at a given moment. This type of education, which works with the knowledge, skills and attitudes necessary to perform some task, is called Competency-Based Education. (GRYPPE, MANGRULKAR and KOLARS, 2012)

In 1978, McGaghie et al., described the Competency-Based Medical Education (CBME) with 3 characteristics: 1- organization of educational activities according to functions necessary for the practice of medicine in a given scenario; 2- principle that all students can achieve pre-established basic goals; 3- claim that learning and its process can be empirically tested. (TEN CATE, 2017).

For Perrenoud (1999), competence is the ability to mobilize and integrate the set of specialized knowledge and knowledge, resources and skills to solve problems in a specific professional context. Contrary to the traditional model, with learning goals and knowledge to be acquired, competences focus on what the student must be able to do, with the final result being the central goal. Due to its direct relationship with the practical world of work, it is considered an indispensable condition for improvements in global health. (GRYPPE, MANGRULKAR and KOLARS, 2012).

According to Jocelyn Lockyer et al (2017), the implementation of competency-based medical education meant that “assessment

of learning” was gradually replaced by “assessment for learning”. This change corroborates the fact that, currently, more comprehensive forms of evaluation have been sought, which allow the achievement of goals much more focused on learning, guidance and improvement than simply the achievement of grades and performance in periodic tests.

Given the growing need for innovation in the methods of evaluating the performance and evolution of residents, this review was designed to present the relevance of competency-based models. Associated with any type of teaching-learning, traditional or based on competences, there is a need for an assessment method. As in the university environment itself, where controlled simulations, progress tests, among other evaluation models can be carried out, in the in-service internship there must also be an evaluation strategy.

Due to the importance of the topic for medical education, the goal of this work is to review articles that address different tools and assessment methods based on the competences of the Resident Doctor in Family and Community Medicine. It is hoped, with the results obtained, to contribute to medical residency in Brazil, putting it in line with the highest existing standards of evaluation.

## METHODOLOGY

This is an integrative review, whose goal is to synthesize in an orderly manner the results addressed by research on the subject in question, helping to deepen it. The integrative review consists of carrying out the following steps: 1 - elaboration of the review question; 2 - search and selection of primary studies; 3 - data extraction from studies; 4 - critical evaluation of the primary studies included in the review; 5 - synthesis of the review results and 6 - presentation of the method. (MENDES, SILVEIRA and

GALVÃO, 2019). Thus, in the first stage, the research question was defined: “What are the strategies, pointed out in the literature, for a competence-based assessment of the resident physician in Family and Community Medicine?”

To select the articles that answered the research question and the goal of the review, a search was carried out in the database: *Publisher Medline* (PubMed) and Virtual Health Library (BVS), which included Latin American Literature on Health Sciences (Lilacs) and *Medical Literature Analysis and Retrieval System Online* (Medline). For the operationalization of this research, the Science and Health Descriptors (DeCS) and Medical Subject Headings (MESH) were used through the Boolean operator *and*: “*family medicine*” [AND] “*residency*” [AND] “*assessment*” [AND] “*competency*”, which must be present in the title and/or abstract of the article. Articles published between the years 2010 and July 2020, in English and Portuguese, non-duplicated, with full text available and addressing the following subjects were included: Internship and Residency and/or Family and Community Medicine.

When using only the descriptors, a total of 98 articles were found, 47 from the VHL and 51 from Pubmed, reaching a total of 49 after applying the previously defined criteria. Of these 49 articles, all titles and abstracts were read and, after removing duplicates and/or those that failed to answer the guiding question, 6 articles remained included in this study (Chart 1).

The 6 articles were read in full, ordered and summarized according to title, authors, journal, year of publication, country of origin, participants and results. Finally, from the categorization and analysis of the 6 articles, it was possible to interpret the results found and perform a critical analysis regarding the different evaluation methods

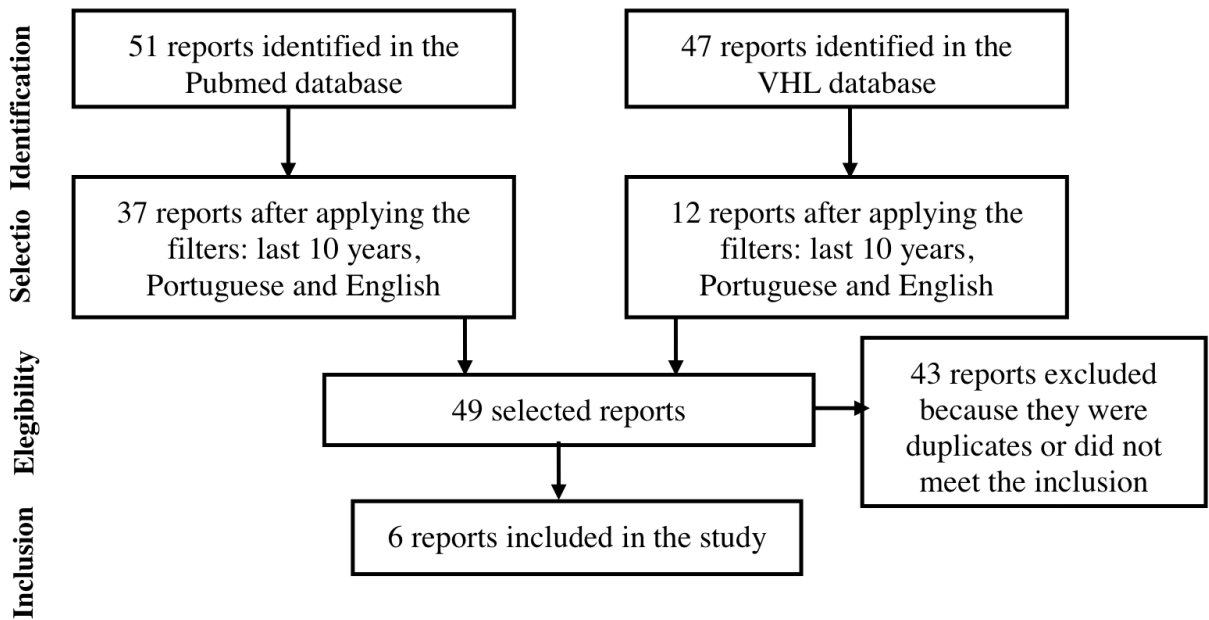


Chart 1 – search and selection flowchart.

Source: produced by the authors.

of the resident physician of the Family and Community Medicine program.

## ANALYSIS AND DISCUSSION OF RESULTS

The analysis of the selected articles included relevant information from the selected publications, such as: title, authors, journal and year of publication, providing an overview of the selected studies. (table 1).

Table 2 presents the methods and results of the analyzed articles, with the purpose of deepening the analysis of the themes presented in the publications that compose the study.

Among the articles presented, 50% are publications from the United States, with the other 50% from Canada. An explanation for this would be the fact that some evaluation methods presented have been developed and widely used in these countries. All articles were published in the last 10 years, with a third of the total published in 2011.

Four different competency-based assessment methods were found, namely:

1- Clinical Assessment Mini-Exercise (Miniex), 2- Milestones, 3- Competency-Based Achievement System (CBAS), and 4- Entrustable Professional Activities (EPAs).

## COMPETENCY-BASED ASSESSMENT STRATEGIES FOR RESIDENTS IN FAMILY AND COMMUNITY MEDICINE

For LeBeau et al. (2019), six essential competencies must be evaluated during the training of residents: 1- medical knowledge, 2- patient care and procedural skills, 3- interpersonal and communication skills, 4- professionalism, 5- learning and improvement based on practice, and 6- systems-based practice. The author states that direct observation tools are a great way to assess these clinical skills, mainly because they are able to assess the student in real moments of direct contact with the patient.

Baglia et al. (2011) described the development – through the joint effort of professionals involved in a family medicine

Title		Authors	Magazine and Year of Publication	Methodology and Goal
A	<i>Competency Assessment in Family Medicine Residency: Observations, Knowledge-Based Examinations, and Advancement</i>	Arch G Mainous 3rd, Bo Fang, Lars E Peterson	Journal of Graduate Medical Education, 2017	The purpose of this article was to investigate, using a national sample, the relationship of competency-based FM assessments with residents' progress and the complementarity of milestones with knowledge-based assessments in FM households.
B	<i>Assessing Competency in Family Medicine Residents Using the Osteopathic Manipulative Medicine Mini-Clinical Evaluation Exercise</i>	Lawrence LeBeau, Christine Morgan, Deborah Heath, Vanessa K Pazdernik	The Journal of the American Osteopathic Association, 2019	The goal of this work was to determine whether the OMM Mini-CEX is perceived as an effective assessment tool to assess the OMM core competencies of family medicine residents.
C	<i>Competency-based Achievement System: Using Formative Feedback to Teach and Assess Family Medicine Residents' Skills</i>	Shelley Ross, Cheryl N Poth, Michel Donoff, Paul Humphries, Ivan Steiner, Shirley Schipper, Fred Janke, Darren Nichols	Canadian Family Physician, 2011	The goal of this work was to develop a method to assess residents' competencies in various skills and identify those who are having difficulties.
D	<i>Generating Developmentally Appropriate Competency Assessment at a Family Medicine Residency</i>	Jay Baglia, Elissa Foster, Julie Dostal, Drew Keister, Nyann Biery, Daniel Larson	Family Medicine, 2011	The goal of this study was to generate observable behaviors, developmentally appropriate, that assess competences. Eight steps guided the development of this assessment system: (1) Generate residency-specific competencies, (2) Define residency-specific competencies, (3) Identify assessment principles, (4) Compose and analyze narratives of excellence within each competency, (5) Refine standard statements from narratives and organize into Dreyfus competency levels, (6) Derive observable behaviors from standard statements to directly correlate behaviors and competency levels, (7) Develop assessment tools (based on observable behaviors) for six residency learning sites and (8) Translate assessment tools to ACGME competencies.
E	<i>Association of a Competency-Based Assessment System with Identification of and Support for Medical Residents in Difficulty</i>	Shelley Ross, Natalia M. Binczyk, Deena M. Hamza, Shirley Schipper, Paul Humphries, Darren Nichols, Michel G. Donoff.	JAMA Network Open, 2018	The aim of this study was to determine whether competency-based assessment is associated with better identification and support of struggling residents. This cohort study of secondary data from the archives of 458 family medicine residents (2006-2008 and 2010-2016) was conducted between July 5, 2016 and March 2, 2018, using a large urban family medicine residency program in Canada.
F	<i>The Application of Entrustable Professional Activities to Inform Competency Decisions in a Family Medicine Residency Program</i>	Karen Schultz, Jane Griffiths, and Miriam Lacasse.	Academic Medicine, 2015	The purpose of this study was to describe the development of 35 EPAs (Entrustable Professional Activities) for a Canadian family medicine residency program, including the work of an expert panel of family physicians and medical education experts from four universities in three Canadian provinces. to identify EPAs relevant to family medicine in nine curriculum domains.

Table 1 - Articles selected for the integrative literature review.

Source: produced by the authors.

Country		Results	Conclusion
A	United States	The study demonstrates that Milestone scores increase with year of residency and that non-knowledge-based skills have a relatively low correlation with ITE scores. So, as predicted, Milestone appears to measure competencies other than medical knowledge, as indicated by the small correlations between the ITE milestones and scores.	Milestone's competency-based assessment of MFC residents appears to be a viable multidimensional tool to use for successful resident progression, with higher scores for residents who have progressed in their program compared to those who have not made.
B	United States	Eighty-one responses were received during 2 survey cycles within a 7 month period. The internal consistency of the survey responses showed high reliability ( $\alpha = 0.93$ ). Considering respondents who agreed that they had an understanding of the overall purpose of the Miniex, the perceived effectiveness score for the OMM Miniex was higher among those who agreed that a Miniex was a useful part of the training than among those who disagreed or were unsure whether its usefulness.	The results suggest that the OMM Miniex can be a useful direct observation assessment tool to assess OMM core competencies in family medicine residents.
C	Canada	The CBAS is designed to test certain skills and behaviors, which allows for formative assessment. The feedback gained facilitates meaningful discussion of residents' progress and allows them to become aware of how to direct their learning and practice guided self-assessment. Research shows that including all CBAS users makes this dynamic process easy to use and useful for assessing competency. There is a feeling of empowerment among users as they realize that they can decide how competency-based assessment will happen for them. We believe this will further enhance the perception of a positive learning environment in our residency program.	By focusing on specific skills and behaviors, CBAS allows residents and counselors to make formative assessments and communicate their findings. The feedback indicates that the CBAS is a user-friendly and useful system for assessing competence.
D	United States	The assessment tools that were created by this process meet the ACGME Requirements for moving to a competency-based model. Tools avoid reducing the assessment to a set of minimally related information measures. These assessment tools also address the challenge of providing much more qualitative feedback than is typically collected from the comments section of typical assessment forms. The residency-specific competencies and the six identified learning assessment sites work together to provide a comprehensive picture of the resident's performance in context.	Narrative reflection was an effective method for linking observable behaviors to competencies. The process was lengthy; however, greater efficiency and enthusiasm is expected in the use of these assessment tools, with greater confidence in the program's ability to assess training results. Future research must include the comparison of these tools with those of other programs.
E	Canada	The CBAS approach to assessment appears to be associated with better identification of struggling residents, facilitating the program's ability to address student competence deficiencies. After the implementation of CBAS, residents who faced challenges were more welcomed and their shortcomings were not repeated in later rotations. A key argument for moving to competency-based medical education is the need to change assessment strategies. These findings suggest that competency-based assessment can be useful.	The CBAS approach to assessment appears to be associated with better identification of struggling residents, facilitating the program's ability to address student competence deficiencies. After the implementation of CBAS, residents who faced challenges were better supported and their deficiencies did not recur in later rotations. A key argument for moving to competency-based medical education is changing assessment approaches; these findings suggest that competency-based assessment can be useful.
F	Canada	Early results indicate that preceptors use EPA field notes more often than generic field notes. EPAs allow educators to assess multiple goals and competencies that are important but difficult to manage by providing practical, manageable, and measurable activities that can be used to assess competency development.	EPA field notes are a key tool for assessing competence development in residents in a way that addresses some concerns about the CBA (competency-based assessment) and aligns with the van der Vleuten utility index (validity $\times$ reliability). $\times$ educational value $\times$ acceptability $\times$ cost-effectiveness). EPA field notes exhibit validity because they integrate the knowledge, skills, attitudes, and values of each EPA and apply them directly to patient care.

Table 2 - Content of articles analyzed.

Source: produced by the authors.

residency program – of 8 guiding steps for the creation of a competency-based assessment system. These steps were focused on concrete behaviors that reflect the student's evaluable performance.

In step 1 – generating residency-specific competencies – the faculty reached a consensus on what would be the requirements for the practice of Family Medicine in the present and future, which resulted in 7 competencies: (1) relationship-centered care, (2) comprehensive care, (3) information literacy and knowledge creation, (4) leadership and change management, (5) community health partnership, (6) lifelong learning, and (7) self-care; in step 2 – defining the competences – the teachers refined the definitions of the chosen competences, making them more adequate, precise and easy to understand; in step 3 – cultivating evaluation principles – determining principles of evaluation were defined: (1) direct observation is ideal and includes evaluation and feedback, (2) several methods can be used, (3) evaluation is consistent insofar as behaviors are identified and variations in interpretation are minimized, (4) assessment and feedback are timely and expected, and (5) effective assessment practices depend on ongoing faculty development; in step 4 – elaborating narratives – the residents were instructed to write narratives that demonstrate the excellent performance of a colleague in one of the 7 competences defined above. These narratives were collected and, in the end, the professors obtained between 7 and 8 practical examples for each competence; in step 5 – developing standardized statements – a part of the faculty analyzed the narratives to define specific patterns in the stories, discussed to reach a consensus, listed in a table the standardized statements with the respective competences, according to 4 of the 5 levels of the Dreyfus skill acquisition model (novice, advanced

beginner, competent and proficient); in step 6 – operationalizing observable behaviors – for each Dreyfus level, we defined how the patterns could be identified as observable behaviors. Some examples were derived from previously analyzed narratives, others were requested directly from professors; in step 7 – designing assessment tools for learning sites – to apply the observable behaviors in the assessment, tools were produced for each of the 6 major learning sites (continuing care centers (outpatient care), hospital service, Behavioral Medicine clinic, continuing care teams, learning and educational planning laboratories, where residents can be observed. The tools were tested by residents, faculty and preceptors and then customized for each location; finally, in step 8 – translating observable behaviors into six core competencies of the Accreditation Council for Graduate Medical Education (ACGME) – a table was made showing the correspondence between the observable behaviors and the respective competencies of the ACGME, to ensure use in different residency programs. (BAGLIA, et al., 2019)

### **Clinical Assessment Mini-Exercise (Miniex)**

The Mini-Clinical Assessment Exercise (Miniex), originally created in 1990 by the American Board of Internal Medicine, is an example of a direct observation tool. In it, there are several specific forms to evaluate each area, according to the clinical competences presented. The observer observes the student during a clinical experience, while he/she performs an goal and quick consultation, focused on a specific patient's need. The student is ranked according to their performance in the different dimensions of competences and then receives immediate feedback on their performance. (LEBEAU et al., 2019).



LeBeau et al. (2019) cite as an example a medical residency program that uses 2 forms per month as an evaluation form, totaling 16 forms per year. Each form can be used to fulfill the desired requirement, and there are several categories, such as: breast assessments, neurological assessments, pelvic exams, psychiatric assessments and others.

This assessment method differs from a traditional practical assessment in several respects, mainly due to the duration - while in the first one the student is evaluated in a consultation that would last more than an hour, with Miniex the student is evaluated during a specific consultation, goal, with a maximum duration of 15 minutes. (LEBEAU et al., 2019). This short period allows this tool to be repeated more than once throughout the year. In addition, by providing immediate feedback on their performance, it allows students to participate more actively in their own teaching-learning process.

In the study by Lawrence LeBeau et al. (2019), a modified version of Miniex was designed to assess the competencies of osteopathic manipulative medicine (OMM) in the Osteopathic Family Medicine residency, demonstrating that it is possible to modify and adapt an existing tool - Miniex - to meet various evaluation demands, a positive point for this evaluation form.

In addition, the study observed the following: the residents who most agreed with the effectiveness of the tool were also the ones who most understood and had had adequate training in its use. (LEBEAU et al., 2019). This finding demonstrates the need for adequate training prior to using the tool, not just applying it. Adequately informed and trained residents and teachers regarding the assessment method in use are an essential point for the successful implementation of an assessment tool in this format.

## Milestone

According to Mainous et al. (2017), the six original competencies allowed the creation of Milestones or specific milestones for each specialty directed to each competency, translating what is expected for residents at the basic, intermediate and advanced levels. Through these milestones, it is possible to assess the resident's level of learning and performance, comparing them to the expected level for a given moment in the residency. The Milestones are composed of twenty-two items distributed across the six core competencies: patient care (5 items), medical knowledge (2 items), systems-based practice (4 items), practice-based learning and improvement (3 items), professionalism (4 items) and interpersonal relationship and communication skills (4 items).

In the study by Mainous et al. (2017), to analyze whether the score obtained through the tool faithfully translated the progress of students throughout the medical residency program, mid-year and end-of-year milestones were used for all students of residency programs in Family Medicine and Community Accreditation Council for Graduate Medical Education of the United States.

With a final sample of 6630 students, the scores obtained by those who did not advance in the course (4.1% of students) were compared with those who did advance. Not only was the evolution of the group of students who did not progress in the course lower than those who did, but test scores also increased from one year of residency to the next. (MAINOUS, FANG and PETERSON, 2011).

Despite the study having an important limitation - the small number of the sample of students who did not progress in the course compared to the sample of those who did - it was possible to conclude positively about

the validity of using a competency-based assessment tool to classify the improvement of students in medical residency programs. (MAINOUS, FANG and PETERSON, 2011).

### **Competency-Based Achievement System (CBAS)**

Shelley Ross et al (2011) used previously existing programs in other areas as a basis to design the Competency-Based Achievement System (CBAS) tool, which was developed to assess competencies through 3 main premises: formative feedback, guided self-assessment and regular meetings between residents and consultants. According to the authors, classic assessment models, such as multiple-choice exams, in-training assessment reports, and single skill demonstrations, such as in Goal Structured Clinical Examinations (OSCEs), are not suitable for assessing residents' performance in practice. everyday doctor. These models are limited to the formulation of checklists, which only provide a summative assessment, and are not as effective in providing students with a path to improve their skills and knowledge. In view of this, they sought to build a tool that not only allowed the assessment by competences, but also a way to support the development of these competences by residents and measure their respective progress.

The CBAS encourages greater participation by residents in their own learning, allowing guided self-assessment through formative feedback. After observing an event (diagnoses, decision making, presentations, team interactions, procedures, etc.), immediate notes must be made in a notebook by the observer, in order to summarize feedback and key points for further discussion. These notes must be given to the resident, who will be included in the eCBAS, an electronic database that organizes the information in the form of sentinel habits (skills that must

be present in a good doctor: professionalism, communication skills, clinical reasoning, physician, patient-centered care, practice management, and proper prioritization of the presenting problem), clinical domains (care of pregnant women, newborns, children, adolescents, adults, and the elderly, palliative care, behavioral medicine and mental health, surgical and procedural skills, care of the vulnerable population) and level of progress. This information is used to assess the resident's development in relation to a specific competency.

At the end of 4 months, residents must analyze the information in the database and create a progress report in that period. Then, residents and consultants hold a face-to-face meeting to discuss progress on sentinel habits and clinical domains, the report is evaluated, and the consultant verifies that the self-assessment is correct or that adjustments need to be made. Finally, together, they establish a learning action plan for the next 4 months. The action plan is attached to the final report and this is inserted into the resident's file.

The conclusions of Shelley Ross et al (2011) were very optimistic regarding the improvement of the evaluation system, after the adoption of the CBAS in the family medicine residency. They reported that a sense of empowerment was developed in the residents, due to the possibility of greater control over their own progress. After 8 years of using CBAS in the residency program, enough data were obtained to perform a retrospective cohort study comparing pre-CBAS and post-CBAS performance. The results were published by Ross et al. (2018), demonstrating that CBAS allowed better identification and support of residents facing learning difficulties. These difficulties were detected by receiving flags (indicating below-average performance in some competence or demonstration of unprofessional behavior).

Before the implementation of CBAS, between 44.9% and 50.8% of residents received at least one flag during training; after the implementation of CBAS, this number decreased to between 16.1% and 27%. In addition, the number of residents with flags in 5 or more areas went from between 16.3% and 27.1% to between 0% and 10.7%. It is also important to highlight the relevant increase in files with documentation showing that the flags were effectively discussed with the resident, a percentage that before the CBAS was between 56.7% and 63.6% and after the CBAS it was between 62.5% and 100%. Despite the inclusion of only one residency program – which was pointed out by the authors as an important limitation – it was possible to notice a relevant improvement in the evaluation system, enabling early identification and greater support for residents with difficulties.

### **Entrustable Professional Activities (EPAs)**

Schultz et al. (2015) demonstrate that clinical skills alone can be somewhat impalpable and difficult to measure in everyday life, requiring assessment tools that can cover these skills to succeed in correctly assessing the student. As a result, they bring the Entrustable Professional Activity (EPA) as a good alternative competency-based assessment tool.

Competencies are characteristics of the student's personal quality, while EPAs relate to professional activities carried out in the work environment independently. In a practical way, to carry out an EPA, the student must integrate a series of domains of competences or sub-competencies. (SCHULTZ, GRIFFITHS and LACASSE, 2015).

Therefore, if the student is successful in completing the necessary activities in an EPA, such as caring for a patient with respiratory failure, success would be seen as

success in achieving the necessary skills for such activity, making him able to advance to a new EPA. (SCHULTZ, GRIFFITHS and LACASSE, 2015). Thus, in order to carry out a specific professional activity, the student needs to integrate several competences belonging to different spheres, a fact that ends up facilitating and summarizing their assessment, without losing the practical side of the profession.

In the study by Schultz et al. (2015), with the change in the curriculum of a Family and Community Medicine residency program from a traditional one to a competency-based model, the program began to seek adequate tools for the assessment of these competencies. Thus, after summarizing the different competencies in 9 major curricular domains, they decided to follow a 4-step process for the creation of EPAs: 1- decide which EPAs would be for each of these domains, 2- design the structure of each EPA, 3 - define benchmarks within each EPA, 4- decide how to integrate EPAs into an evaluation system.

The result was the creation of 35 EPAs spread across 9 curriculum domains. The evaluation of each EPA took place from electronic field notes, available for daily remote access and carried out by the preceptors of each EPA, from which, the feedback was carried out based on the competencies needed for each EPA. Field notes were cumulative, from different preceptors at different times and occasions, and were available for review and retrospective evaluation. (SCHULTZ, GRIFFITHS and LACASSE, 2015).

This possibility of assessment brings an innovative approach, which makes it possible for the student to have their entire learning process evaluated and documented over time. Helping in the wealth of information about each one and their teaching-learning trajectory throughout the medical residency program.

It is worth mentioning that the curricular goals are and will always be in constant progress and that the competency-based model will also undergo changes over the years. Therefore, it is essential to keep the different assessment tools and models constantly updated, always adapting them to keep them in line with the advancement of teaching.

## **FINAL CONSIDERATIONS**

Through this review, it was possible to verify the importance and effectiveness of the use, in Family and Community Medicine residencies, of tools and assessment methods based on competencies, mainly because several residency programs are migrating to a competency-based curriculum model. Knowledge about these tools and their correct use enables an integral, complete and practical assessment of students. It also allows the resident to actively participate in the teaching-learning process itself, so that it can evolve more consistently during the residency program.

With this review, it was possible to know and analyze the effectiveness of different existing methods and tools of competence-based assessment. However, it would be interesting to carry out a study comparing these different tools, pointing out the pros and cons of each one and the possibility or impossibility of applying them in complementarity.

Some limitations were found during the writing of this article, such as: the impossibility of generalizing this information, as it focuses only on the Family and Community Medicine residency; testing in only one residency program in a specific location and the lack of proof of effectiveness of the use of these assessment tools in national medical residency programs due to the scarcity of information, articles and assessment instruments validated in the country, leaving a gap to be filled.

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