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# Residents' and preceptors' perceptions on newly introduced milestones—a qualitative study in general practice/family medicine in Finland

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## Abstract

**Background** In the context of competency-based postgraduate education, professional progression is often tracked through milestones, particularly in North American settings. This study aimed to explore the perceptions of residents and preceptors regarding newly implemented milestones in self-assessment and formative assessment within Finland's 6-year national postgraduate education (PGE) program for family medicine/general practice.

**Method** We conducted a qualitative study involving preceptors and residents participating in a nationwide 1-year pilot study that utilized a mobile application for milestone tracking. All five universities responsible for PGE recruited a total of 35 preceptors and 36 residents for the study, which began in April 2022. Participants for the focus group interviews were recruited via email from those study participants still involved in training or serving as preceptors between late 2022 and March 2023. Subsequently, six preceptors and six residents participated in semi-structured interviews, conducted in groups of three participants each. The interviews were conducted separately for preceptors and residents. We employed a constructionist approach and used inductive thematic analysis to examine the data from a sociocultural perspective.

**Results** We identified six major themes reflecting perceptions from both groups: 1) Enhancing goal orientation, 2) Facilitation of supervisory meetings, 3) Milestones document as a tool, 4) Support in assessment, 5) Variability in the search for the zone of proximal development, and 6) Provocation of emotions. The major theme of 'enhancing goal orientation' including the subthemes, was perceived similarly across the groups. However, we found differing emphases in 14 out of 22 subthemes.

**Conclusions** The study provided insights into previously unexplored themes, including the emotional impact of milestones, the role of supervisory meetings, and variability in strategies for searching for the zone of proximal development. Other themes we identified, such as enhancing goal orientation, milestone documentation, and support in assessment, aligned with existing literature.

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**Keywords** Competency-based postgraduate education, Milestones, General practice/family medicine, Qualitative study

## Background

In competency-based postgraduate education (PGE), competencies and their developmental markers are organized progressively i.e., a sequential path supports the development of expertise [1]. Professional progression of learners is widely implemented by the entrustable professional activity concept [2]. In the US setting, progression has been operationalized by the Milestones framework since 2009 [3]. Milestones are defined as “a developmental roadmap for the competencies and sub-competencies. They are behavioral descriptions of the developmental progression of the knowledge, skills, and attitudes that define each of the sub-competencies within the broader competency domain” [4].

Since 2009, numerous reports on the development and implementation of milestones have been published [5]. There are both narrative data [3] and scientific reports catalyzed by the introduction of the Next Accreditation System by the Accreditation Council for Graduate Medical Education (ACGME) [6–8] detailing the perceived benefits and challenges of implementing milestones. Milestones provide a useful platform for assessment and feedback and are consequently felt to catalyze more effective assessment and feedback for residents [3, 7]. Milestones are also perceived to help faculty members develop shared mental models of competence [3], give residents a roadmap for learning [6], and identify curricular gaps [3]. However, educational jargon and the framing of language represent challenges from the users' perspective [3]. Furthermore, in a qualitative implementation study on Milestones framework across 16 PGE programs in 2016–2017, attending physicians and residents “remained skeptical of the validity and the value of utilizing the competency-based Milestones framework to provide context for residency training” [8].

The Milestones concept has become mainstream in PGE in the US [3]. Consequently, reports on the pros and cons of the concept are primarily derived from US experiences. In scientific reports, perspectives of residents and preceptors are infrequently represented. The paradigm shift towards competency-based education is underway in diverse settings, and the milestones concept has been accordingly adapted. Therefore, insights from experiences of implementing this concept will be valuable for those starting from scratch and working in different contexts than the North America.

The first version of milestones in a PGE program for general practice/family medicine (GP/FM) in Finland was introduced in 2016 by the University of Helsinki [9]. Five years later, the first national version of milestones

for the PGE program in GP/FM was published [10]. They are intended for guided self-assessment and formative assessment.

We set out to explore how residents and preceptors perceived the newly introduced milestones in their intended uses for self-assessment and formative assessment, within the national PGE program for GP/FM, in Finland.

## Method

### Study design

We employed a qualitative methodology with a constructionist orientation [11] to collect and analyze our data. Data collection was carried out through semi-structured focus group interviews conducted separately with preceptors and residents. We then applied inductive thematic analysis [12]. During this process, we reflected on the themes through the framework of sociocultural theory as interpreted by Allman [13]. This theory posits that cognitive development is deeply influenced by social interactions and learning within the zone of proximal development (ZPD), which together shape an individual's mental abilities and educational experiences. This theoretical framework was selected due to its application in faculty development within the GP/FM specialty in Finland.

### Context

In Finland, postgraduate medical education is organized by universities but delivered within the healthcare system, coordinated by the Ministry of Health and Social Services. After completing a six-year undergraduate medical program, most graduates in Finland opt to specialize in one of the fifty available medical specialties, among which GP/FM is the most populous, with approximately 1,600 residents. As of 2020, all five Finnish universities responsible for undergraduate and postgraduate medical education have adopted a national PGE program, including an assessment program for GP/FM. The impetus for this was the statute launched by the Ministry of Health in 2020 [14].

Since the launch of PGE programs in GP/FM at the universities in the late 1980s, competence has been jointly assessed through a written examination only. During the 1990s, logbooks or even portfolios were also required in some universities. In this millennium, universities have adopted workplace-based assessment approaches at varying paces, all for formative purposes.

The six-year GP/FM specialization includes at least three years of clinical service in primary health care and

a minimum of eighteen months in other relevant clinical specialties. An additional eighteen months are allocated to further clinical service or study, tailored to the resident's individual needs and learning plan. During their service in primary health care, residents work independently while being supervised by their personal preceptor, with whom they have weekly supervisory meetings. This arrangement fosters long-term resident-preceptor relationships.

In Finland, primary health care services have been provided to citizens through multi-professional, publicly funded municipal health care centers since 1972. As of 2023, a historic reform was underway, with the establishment of novel wellbeing services counties tasked with the responsibility for health care provision [15]. Concurrently, PGE in all specialties is set to undergo a transformation towards a competency-based model by 2030 [14].

### Milestones

The milestones were constructed in national collaboration by a specific working group, professors responsible for the training program, preceptors, and residents in 2020–2021. The domains of competence were defined and agreed upon earlier. Therefore, the work commenced on the definitions of the behavioral descriptors, followed by the actual milestones themselves. During the construction, we agreed to create a path of sequential behaviors in each curricular goal that would indicate an optimal route for the development of competence. A total of 15 PGE developers, specialists in GP/FM, participated in the specific working group, which was divided into various subgroups of 5–6 participants working on each competence area. Work in progress was discussed with professors who had not participated in the working groups, as well as with numerous preceptors and residents on various occasions. Consensus on the contents of the milestones and the order of the milestones within a curricular goal was reached after an iterative process. Finally, assessment strategies relevant to each milestone or curricular goal were proposed.

We introduced the national milestones for GP/FM PGE in 2021. In these milestones, we use the term “domains of competence” [16] rather than “competencies” and “curricular goal” in place of “sub-competency” (Supplementary Material 1). Four-level behavioral descriptors (milestones)—novice, advanced resident, specialist, advanced specialist—were developed for each curricular goal. The behavioral descriptors employed can be characterized as either context-oriented, which involves the expansion of the scope of engagement, or socially oriented, which signifies progression from learning to teaching, leading, role modeling, or serving as a consultant for others [17]. The 33 curricular goals of the specialty are organized into seven domains of competence

(Supplementary Material 2), which reflect the CanMEDS framework [18].

The application used to track the milestones during the study is widely utilized in schools and in sports coaching in Finland. The idea was to select, preferably together with a resident and a preceptor, a few curricular goals or one competence area at a time and focus guided self-assessment and follow-up of development using the milestones of the respective goals. A resident could progress to the next level after self-assessment or demonstration of performance to the preceptor. In the supervisory meeting, discussion on progress was the main focus, with the application serving only as a facilitative tool.

### Recruitment and data collection

All five universities responsible for GP/FM PGE participated in this nationwide study. The aim was to evaluate the applicability of a mobile application for the use of milestones in guided self-assessment and formative assessment, as well as to explore how residents and preceptors perceived the newly introduced milestones. We aimed to recruit fifty resident-preceptor dyads to use the milestones over a one-year period. The results on the applicability of the application have been reported elsewhere [19]. Within each university, the coordinator for GP/FM PGE sent emails between January and February 2022 to both residents and preceptors on the respective email lists. Residents planning to complete their training in health centers during the year 2022 were invited to volunteer. Potential participating residents were also sought via 600 preceptors. The precise number of residents contacted remains unknown. A total of thirty-five preceptors and thirty-six residents volunteered to participate in the study, which commenced in April 2022. Two members of the research team (AH-S and VK) conducted the recruitment of participants for focus group interviews. They approached trainees who were still engaged in training (30) and preceptors serving in health centers (29) during the period from late 2022 to March 2023 via email. Subsequently, six residents and six preceptors volunteered for the focus group interviews (Table 1).

The interview guide for both groups was constructed de novo during research group meetings (Supplementary Material 3) and updated iteratively after each successive interview.

We conducted two focus group interviews with the residents (three in each) and two with the preceptors (three in each) between February and April 2023. A single member of the research group (AH-S) facilitated the interviews conducted via video conferencing, with assistance from either VK or VV. The videotaped interviews ranged in duration from 40 to 50 min and were transcribed verbatim. We deleted the recordings after verifying the accuracy of the transcriptions by the interviewers. Thereafter,

**Table 1** Demographics of the participants in the focus group interviews between February and March 2023 by the role

	Residents	Preceptors
Gender identification		
Female	5	6
Male	1	0
Years since MD		
1–5	6	0
6–10	0	1
11–15	0	1
16–20	0	0
21 or over	0	3
Unknown		1
Length of training (years)		
≤ 1	5	NA*
2	0	NA*
3	1	NA*
4 or over	0	NA*
Faculty years in precepting		
1–5	NA*	2
6–10	NA*	1
11–15	NA*	1
16 or over	NA*	0
Unknown	NA*	1

\*NA Not asked

it was not possible for other group members to identify the interviewees.

### Analysis

In the initial phase of the thematic analysis, three individuals (AH-S, VK, and VV) independently familiarized themselves with the data and began coding. To support the next phase, they developed a coding template that included key phrases, codes, and categories. Subsequent iterative meetings were held to compare and discuss findings to resolve any discrepancies. Prior to the first full group meeting, another researcher (TK) coded the data independently without the coding template. Through iterative discussions conducted via videoconferencing, we organized codes into categories and eventually created themes and subthemes.

One research group member (AH-S) translated selected quotations into English, while another member (MB) performed back translations to verify accuracy in tone and content. Discrepancies that arose were settled through consensus. To assist in this process, we utilized both ChatGPT 4.0 and Google Translator.

### Research team reflexivity

The research team comprised one professional educator (Master of Arts) (VK) and seven physicians who collectively possessed 120 years of clinical experience and 110 years of experience in medical education. Among the physicians, K.S. has served for 35 years in medical

education in various roles in Canada and five (AH-S, LMT, NT, TK, VV) have medical trainer qualifications granted by the Finnish Medical Association. Among the team members, six (AH-S, LMT, NT, TK, VK, VV) contributed to the development and implementation of the Finnish milestones, while KS was involved in creating a set of entrustable professional activities and milestones in the Canadian context. The variability in the length of educational experience within the group, ranging from 1 to 35 years, allowed us to interpret results from various perspectives. We were consciously receptive to criticism concerning milestones as six out of seven researchers had contributed to the development and implementation of the Finnish milestones. In interviews, there was no power relationship between the interviewers and the interviewees.

### Results

Our analysis resulted in six major themes: enhancing goal orientation, facilitation of supervisory meetings, milestones document as a tool, support in assessment, variability in the search for the ZPD, and provoking emotions (Fig. 1). In the following sections, we present the themes and subthemes with illustrative quotations.

#### Enhancing goal-orientation

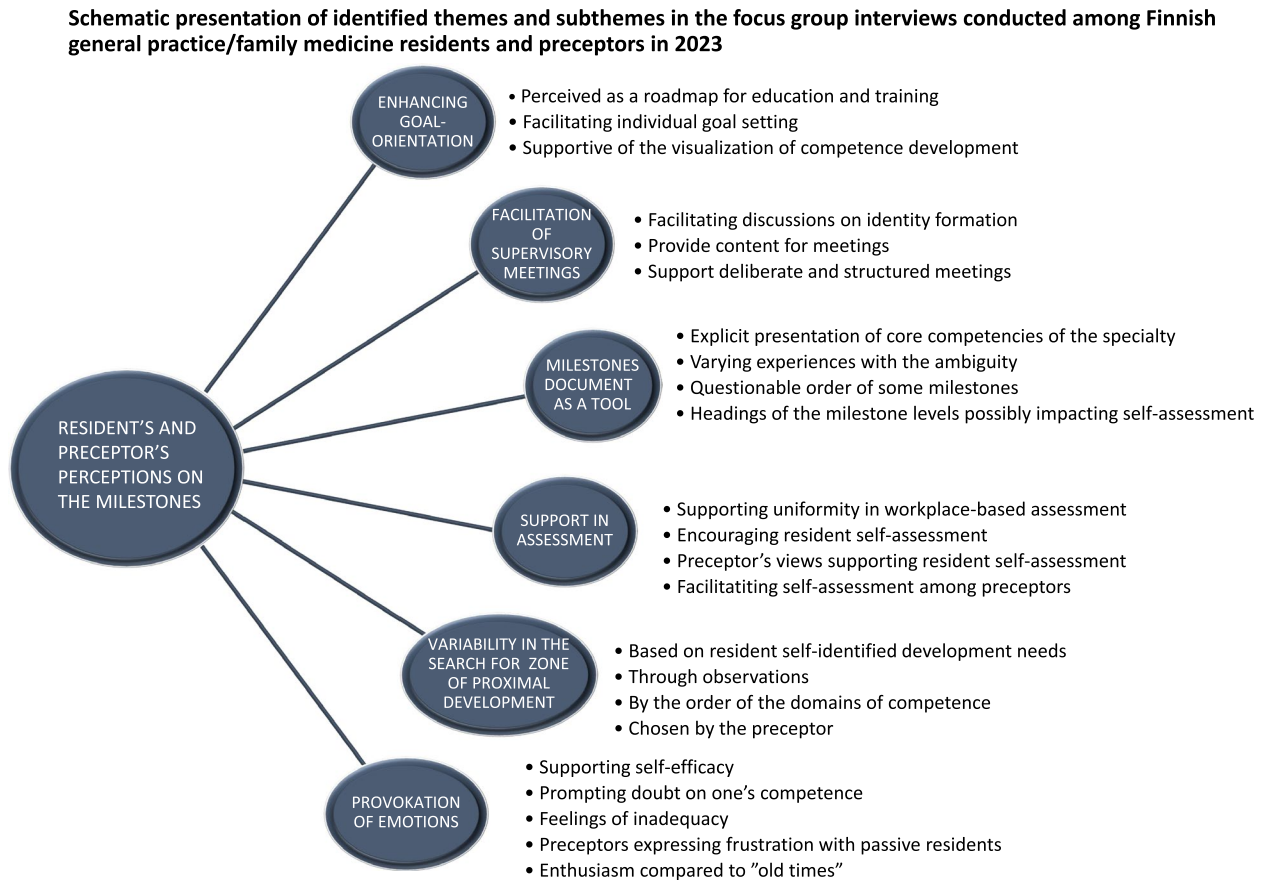
Both residents and preceptors appreciated the concrete guidance provided by the milestones, particularly in fostering an “end in mind” mindset. Milestones were perceived by both groups as *a roadmap for education and training*.

*...a certain kind of...a bit like concrete issues... it's not just you have to know how to be a manager or a clinician, but actually concrete issues, what was there in those milestones...they really clarified where we are striving to with this education. (Resident = R)*  
*And in my opinion, the milestones document gives the resident a perspective of what they should be able to do, what kind of competencies specialists in general practice have, and they can see their own development there. (Preceptor = P)*

Furthermore, the milestones were found to *facilitate individual goal setting* during education.

*Yes, in my opinion, it has been useful that I have noticed some strengths... I'm already here at the specialist level. I have also noticed a surprising number of issues where I do not actually work so well...and I should focus on those. (R)*

*Yes, the milestones, they are good, and the discussions that arise based on these, really, I think that they are developmental, they support your learning,*



**Fig. 1** Schematic presentation of identified themes and subthemes in the focus group interviews conducted among Finnish general practice/family medicine residents and preceptors in 2023

*and with them you can also find the direction we should develop from now on, what are the goals for development. (P)*

Presentation of sequential development – that is describing behaviors at each level – was a novel approach for both residents and preceptors. In both groups, the milestones were considered *supportive of the visualization of competence development*.

*The visibility of progress has [previously] been the most challenging... even though there has been progress. Now we can see in concrete the progress, and that is a good thing. (R)*

*Yes, and just the fact that I perceive where we are at each moment. At the beginning [of the use of the milestones], when I did self-assessments, I got a little idea about the level at that time. From the initial situation, and by self-assessing along the way, I spotted that hey, this thing is going much better than at the beginning. You can follow up on how you are progressing in concrete. (P)*

### Facilitation of supervisory meetings

In our context, the resident-preceptor relationship typically extends from months to years. Beyond workplace-based assessment and accompanying feedback discussions, supervisory meetings serve as a platform for the identity formation of an GP/FM specialist. Milestones were noted by residents to *facilitate these discussions*.

*As both of us, me, and my preceptor, tend to philosophize and have wide-ranging discussions, the milestones have worked very nicely as a steppingstone to where topics have come from. (R)*

*I have found the milestones quite useful since I have thought about an issue a little more broadly than based on, for example, a single assessment. (P)*

From the preceptor's point of view, milestones provided *useful content for meetings*.

*There they are, big concepts... to lean on...what content could be discussed...and to be raised to meta level from there, when a resident brings into the discussion issues, she/he has been thinking about...you,*

*as a preceptor, do not have to come up with everything by yourself what to be dealt in a meeting. (P)*

Milestones may support deliberate and structured supervisory meetings, as expressed by one resident.

*We have simply put these milestones in the half-year plan [of supervisory meetings], because otherwise they might be left behind. (R)*

#### **Milestones document as a tool**

The tool, including the four-level milestones for curricular goals, appears to capture relevant descriptors, as some interviewees found *core competencies of the specialty made explicit*.

*And then I thought, what kind of specialist am I, what are my special skills? Well, this [the milestones] concretizes it in a completely different way [than before]. (P)*

*However, as a specialty, this is so terribly broad that there is so much more to it than just patient work, that it is precisely that social perspective and effectiveness, that are so prominently present in this specialty. (R)*

Interviewees reported *varying experiences with the ambiguity of the milestones*.

*I have got feedback from residents and preceptors that the language [in the document] is in some places difficult to interpret. (P)*

*...some of them are embracing the world, very vast entities.... (R)*

*Well, as a rule, I think they were quite comprehensible, so very, very rarely there were some concepts, ...which were not familiar to me,...but as a rule, they were comprehensible. (R)*

Although the concept of the milestones was found to be useful, the *sequencing of some milestones raised questions* – that is, behaviors described in certain sequential milestones were not observed in everyday professional practice.

*In everyday life, the skills probably do not develop according to the [behaviour described in the milestones document] levels from one to four...instead, you may have competencies on the level four without being able to act on the level three... (P)*

*I have found several places where the lower level is demanding clearly wider competence than the higher one...and I would like to have them vice versa...or at least question the order of the milestones. (R)*

Residents noted that the *headings of the milestone levels might impact self-assessment*.

*The headings of the milestones, yes, they guide a little the selection of the level. If there were no headings, I could have imagined reaching a higher level than with the headings. That is how I feel. (R)*

#### **Support in assessment**

Preceptors recognized the milestones as a tool *supporting uniformity in workplace-based assessment*, as expressed by one preceptor.

*Now, when we have the competency-based curriculum, we preceptors are acting as assessors. However, as everyone and each of us is an individual and personality, this kind of plan [for the development] guarantees due process for residents, perhaps making assessment comparable, or of uniform quality. (P)*

From the residents' perspective, the milestones *encouraged self-assessment in areas beyond just clinical skills*.

*...the milestones directed me thinking about such competencies that you do not contemplate during your day-to-day working, in contrast to clinical skills...such as how I am doing in collaboration or management skills...(R)*

Although residents experienced difficulties in self-assessment in general, the *views given by the preceptor supported self-assessment*.

*...it is difficult [to self-assess] ... (R)*

*...I do not know... it may be in our culture that you always assess yourself more critically than you assess others. However, when your preceptor is acting as an observer, and supporting and guiding you... [it is getting easier] (R)*

The milestones may also *facilitate self-assessment among preceptors*.

*I must admit that I am reflecting on my own competence with the milestones all the time and contemplating whether I am really doing on the level of specialist in general practice. (P)*

#### **Variability in the search for zone of proximal development**

ZPD is a key concept in the sociocultural theory, emphasizing the range of tasks that learners can achieve with guidance and collaboration, fostering discovery, problem-solving, and critical thinking in supportive educational

environments. Some residents reported selecting competence domains or curricular goals for development based on their *self-identified needs*.

*Yes, at least from my point of view, it started out as a need. I remember that I chose for the first self-assessment of the management skills as I dislike issues related to it. Whereas I did not consider clinical competence as critical, as I was already at the final stage in training, and I thought that I am doing pretty well clinically. In a way, I tried to go over those more challenging issues with my preceptor. (R)*

*I am in early stages in training, and therefore I started with the clinical skills, those that I personally felt were important. (R)*

ZPDs have been identified through *observations* during the mini clinical evaluation exercise. These observations were further elaborated in supervisory meetings, culminating in the setting of personal goals.

*I have had mini clinical evaluation exercises [with my preceptor] and [personal] goals have then been elaborated based on feedback from these. (R)*

Some dyads did not focus on finding the ZPD. Instead, they began at the start of the tool and proceeded *in the order the domains of competence presented*.

*We started using the milestones from the first competence and moved on from there in order. If I had spotted to look for the challenges [of a resident] or relevant level of milestones as a goal, we could have had different discussions there... (P)*

One preceptor reported *choosing the domain of competence by herself for residents* and assigning homework to them.

*In practice, I give them as homework, say, the "Professional" domain of competence [the first in the tool] and ask them to self-assess the curricular goals within the competence. Afterwards, we have [the results of] self-assessment there in the residency management system, and we can take out there one [domain of competence] at the time to be discussed. (P)*

### **Provocation of emotions**

Milestones elicited a range of emotions in both groups. Interviewees reported *feeling support for self-efficacy* from the milestones.

*I have been happy to notice...when I have selected a suitable milestone's level for me without considering the milestone heading, I have experienced a boost of self-efficacy, especially if my preceptor agrees with me, I am feeling pleased. (R)*

*I must admit that I am reflecting on my own competence with the milestones all the time and contemplating whether I really am on the level of a specialist in general practice. On the other hand, sometimes it's so gratifying to notice that yes, maybe now I can say with a good conscience that I'm a specialist in general practice. (P)*

Conversely, milestones sometimes prompted *doubt on one's competence*.

*... I have perhaps had a critical attitude to myself, like it won't be possible for me to be on that level yet... Surely, I should actually rank myself on the lower levels as I am a novice, anyway. (R)*

Additionally, a resident expressed *feelings of inadequacy* after reviewing the entire document.

*...should I really master all of these... (R)*

From a broader perspective, one preceptor expressed *frustration with passive residents*.

*I only wish residents to be more self-directed and willing to participate [in various activities]. (P)*

In conclusion, preceptors considered the difference between past and present approaches significant. A preceptor even *expressed enthusiasm favorably comparing the current system to "old times"*.

*Compared to my own training, this really is fantastic nowadays. (P)*

The major themes created were the same for both groups. The major theme of 'enhancing goal orientation' including the subthemes, was perceived similarly across the groups. However, we found differing emphases in 14 out of 22 subthemes. For example, preceptors saw the milestones as providing content for supervisory meetings, whereas residents thought milestones could provide structure. Furthermore, one resident noted that the headings of the milestone levels might impact self-assessment. Preceptors in our study, on the other hand, recognized that the milestones document supported uniformity in workplace-based assessment and that residents engaged in self-assessment across all competence domains with the support of preceptors. Additionally, even preceptors

themselves engaged in reflective practices based on the milestones and conducted self-assessment accordingly. In the search for ZPD, preceptor-driven or resident-driven strategies were applied in addition to discussions after observations on a mini clinical evaluation exercise. Milestones prompted doubt regarding competence and feelings of inadequacy among residents only, whereas only preceptors expressed enthusiasm when comparing the milestones era to the past.

## Discussion

The results of our nationwide study on the newly implemented milestones for guided self-assessment and formative assessment provided insights into themes previously unexplored within the use of milestones, such as the emotions provoked, variability in the search for the ZPD, and the facilitation of supervisory meetings. The remaining major themes identified—enhancing goal orientation, the milestones document as a tool, and support in assessment—align with observations from North America [3, 6–8].

### Provocation of emotions

The headings of the milestone levels (such as novice, advanced resident, specialist, and advanced specialist) or a milestone itself may impact self-assessment, provoking feelings of inadequacy or doubt about one's competence among residents. However, by supporting autonomy, milestones may enhance intrinsic motivation to learn and develop [20], as residents may experience heightened self-efficacy. Among preceptors with extensive experience in supervision, positive emotions—including enthusiasm—may arise with the implementation of a new tool.

### Variability in the search for ZPD

Residents may find the extensive number of curricular goals or milestones overwhelming. In such circumstances, focusing on the ZPD [13] or the learning needs of a resident may be beneficial. The ZPD is likely the most widely adopted concept related to sociocultural theory; it refers to “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” [13]. Among our interviewees, some reported using resident-focused strategies in the search for the ZPD, while others clearly employed preceptor-driven approaches. However, there were instances where no search for the ZPD was attempted. This may indicate a deficiency in the shared mindset of competency-based PGE [1] among interviewees, particularly since the implementation had only recently begun. Cultural shifts in education will take time, as illustrated by a report from a Canadian family practice PGE program

[21]. Additionally, this finding may reflect the notion that not everyone perceives the developmental path described in the milestones in the same way; some thought earlier milestones were more complex than later ones. Consequently, those preceptors might cease to encourage development at what they perceive as a more complex, earlier milestone.

### Facilitation of supervisory meetings

Supervisory meetings, primarily conducted between a preceptor and an individual resident, occasionally involving a group of residents, are reserved for discussions on specialty-specific ways of thinking and acting, which are essential for identity formation and role modeling [22]. Workplace-based formative assessments and guided self-assessments are also intended to take place during these meetings. The milestones were perceived as a link between these activities, providing both content and structure for the meetings. Consequently, milestones may enhance the sense of relatedness between a resident and a preceptor, which is considered a motivational factor in development [20]. Milestones could also facilitate GP/FM PGE education, as expectations for the competence of specialists are explicitly outlined.

### Enhancing goal orientation

Both preceptors and residents considered the support provided by the milestones in GP/FM PGE education as important. This aligns with findings from other settings, where milestones are perceived to help faculty members develop shared mental models of competence [3], provide residents with a roadmap for learning [6], and identify curricular gaps [3].

### Milestones document as a tool

The formulation of milestones in our context, as well as in other settings [3, 6–8], has been considered problematic. Criticism directed towards our depiction of the milestones by some interviewees pertained partly to ambiguity in phrasing and partly to certain sequential milestones; the notion of delineating behaviors in a sequential manner does not seem to resonate with the realities encountered in everyday professional practice.

The ambiguity experienced in the formulation of the Finnish GP/FM milestones may be partly associated with the terminology used and partly with the approaches selected. The context-oriented or socially oriented approaches employed for the milestones were grounded in both contextual considerations and pragmatic principles. In Finland, physicians are permitted to work independently immediately upon graduation. Furthermore, residents are considered part of the workforce, as there are no designated posts for residents in primary health care settings. Therefore, we opted for the aforementioned

approaches instead of the widely applied learner- or supervisor-oriented approaches, where competence is reflected in the perceived ability of a learner to perform increasingly difficult tasks or the need for decreasing supervision when performing a task [17]. Additionally, based on context, we incorporated an aspirational dimension in the milestones.

The adaptation of expertise theory [23–25] to clinical medicine may not adequately acknowledge the complex nature of clinical problem-solving skills. In GP/FM, physicians—regardless of their career status—encounter patients with undifferentiated problems. They must make decisions based on incomplete and ever-evolving information while considering patient preferences. In the resource-constrained GP/FM context, it may not be feasible to restrict residents' patient care based on the perceived difficulty of the task, as modeled by expertise theory.

#### **Support in assessment**

Preceptors in our study recognized that the milestones document supported uniformity in workplace-based assessment, and residents reported engaging in self-assessment across all competence domains. In other settings, milestones provide a useful platform for assessment and feedback and are consequently perceived to catalyze more effective assessment and feedback for residents [3, 7]. Furthermore, family medicine program directors in the US reported that milestones provide structure to assessment and feedback [8]. In our context, even preceptors engaged in reflective practices based on the milestones and conducted self-assessments accordingly.

Some preceptors reported engaging in self-assessment similar to that of residents, which may enhance their ability to evaluate performance as they develop a deeper understanding of the behaviors described in the milestones. This could further amplify the impact of milestones on assessment and feedback discussions, fostering a shared mindset regarding competency-based PGE.

#### **Consistency between the preceptors and residents**

The differing emphases of perceptions presented in sub-themes by preceptors and residents are understandable given their roles. Preceptors may have supervised numerous residents throughout their careers, whereas for a resident, PGE and supervision are unique experiences. By analyzing the interviews in one study, we may have obtained more credible results than if we had focused solely on one group. Furthermore, the small number of participants in each videoconferencing session facilitated open discussions, enriching the results within both groups.

#### **Limitations**

We were only able to recruit a small number of participants for the interviews. Concurrently with the study, the Finnish service system [15] and PGE [14] were undergoing major transformational changes, increasing the workload of physicians and decreasing their willingness to participate in any study. This limited both the number and diversity of participants in the intervention and ultimately in the interviews. We anticipate that those interviewed were most likely early adopters, who were aware of the interviewers' roles in the development of the milestones. As a result, we may have missed the opportunity to hear more critical voices. Although discussions were robust with good involvement from the research team, social diplomacy may have subtly influenced our discussions and, consequently, our conclusions. Furthermore, the Finnish context may be unique, as we primarily use milestones for guided self-assessment and formative assessment. Additionally, the early phase of implementation of competency-based PGE in Finland may have influenced the perceptions of the interviewees.

#### **Implications**

The milestones for GP/FM were primarily created to foster a shared mental map of expectations for residents at different stages of training and to provide a roadmap for residents and preceptors. This study has shown that they may have more far-reaching impacts. Preceptors should recognize the importance of being aware of and monitoring the unintended negative emotions associated with milestones. Emotions related to the use of milestones and their potential impacts, as well as value, are worth exploring more deeply in different contexts and phases of adaptation of competency-based PGE. The use of milestones supports structuring supervisory meetings by facilitating discussions on both the current and next developmental steps. An added benefit is that this promotes the development of self-reflection skills, which are critical in a self-regulating profession like medicine, possibly adding a deliberate focus to the milestones and their use. Finally, to improve the clarity and credibility of the milestones, and to respond to the ever-changing context—likely in any setting—they should be regularly updated.

#### **Conclusions**

Our findings offer insights into previously unexplored themes, such as emotions associated with the use of milestones, the facilitation of supervisory meetings, and variability in the search for the ZPD. Milestones may provide insights into how to increase self-efficacy and how they can support not only resident reflection but also preceptor self-reflection. However, the formulation of milestones has been considered problematic in our context as well as in other settings. Milestones are regarded

as a roadmap both in North American settings and in Finnish GP/FM PGE. Consistent with this perspective, milestones were perceived as providing structure to assessment and feedback discussions.

#### Abbreviations

GP/FM	General Practice/Family Medicine
PGE	Postgraduate education
ZPD	Zone of proximal development

#### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12909-026-08589-x>.

Supplementary Material 1. Schematic presentation of the milestones concept applied in GP/FM PGE program in Finland

Supplementary Material 2. The 33 curricular goals of the specialty are organized into seven domains of competence

Supplementary Material 3. Interview guide

Supplementary Material 4. Ethics

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#### Authors' contributions

Of the authors, AH-S, KS, LMT, NT, TK, VK, and VV conceptualized the study, AH-S, VK and VV interviewed the participants, MB and AHS translated and back-translated the quotes. VV and MB edited the figure. All authors completed data analysis, AHS and VV drafted, edited and finalized the manuscript. All authors read and approved the final manuscript.

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#### Data availability

The transcripts/datasets generated and/or analyzed during the current study are not publicly available due to the confidentiality of the data but are available from the corresponding author on request.

#### Declarations

##### Ethics approval and consent to participate

According to the Finnish legislation, the study was considered human science research instead of medical research (Medical Research Act 488/1999). Ethical review must be carried out prior to gathering data only in certain circumstances that did not apply to this study (Supplementary Material 4). Participation was voluntary and all the participants gave their written informed consent. All data gathered were anonymized and stored in line with data protection legislation (European Union regulation, Article 28 of the General Data Protection Regulation 2016/679). This study adhered to the Declaration of Helsinki (<https://www.wma.net/policies-post/wma-declaration-of-helsinki/>).

##### Consent for publication

Not applicable.

##### Competing interests

The authors declare no competing interests.

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