Trainee-environment interactions that stimulate motivation: A rich pictures study

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Abstract

Context: Staying motivated when working and learning in complex workplaces can be challenging. When complex environments exceed trainees' aptitude, this may reduce feelings of competence, which can hamper motivation. Motivation theories explain how *intrapersonal* and *interpersonal* aspects influence motivation. Clinical environments include additional aspects that may not fit into these theories. We used a systems approach to explore how the clinical environment influences trainees' motivation and how they are intertwined.

Methods: We employed the rich pictures drawing method as a visual tool to capture the complexities of the clinical environment. A total of 15 trainees drew a rich picture representing a motivating situation in the workplace and were interviewed afterwards. Data collection and analysis were performed iteratively, following a constructivist grounded theory approach, using open, focused and selective coding strategies as well as memo writing. Both drawings and the interviews were used to reach our results.

Results: Trainees drew situations pertaining to tasks they enjoyed doing and that mattered for their learning or patient care. Four dimensions of the environment were identified that supported trainees' motivation. First, social interactions, including interpersonal relationships, supported motivation through close collaboration between health care professionals and trainees. Second, organisational features, including processes and procedures, supported motivation when learning opportunities were provided or trainees were able to influence their work schedule. Third, technical possibilities, including tools and artefacts, supported motivation when tools were used to provide trainees with feedback or trainees used specific instruments in their training. Finally, physical space supported motivation when the actual setting improved the atmosphere or trainees were able to modify the environment to help them focus.

Conclusions: Different clinical environment dimensions can support motivation and be modified to create optimal motivating situations. To understand motivational dynamics and support trainees to navigate through postgraduate medical education, we need to take all clinical environment dimensions into account.

1 | INTRODUCTION

In postgraduate medical education (PGME), working and learning in the clinical environment may be challenging[1-4] because working and learning are intertwined, and clinical environments are often complex and dynamic.[5,6] When complexity in postgraduate training exceeds trainees' aptitude, this may affect their feelings of competence and may hamper their motivation.[7,8] Although motivation is positively associated with learning, performance and well-being, hampered motivation may have deleterious effects, including diminished well-being, stress and reduced performance.[7,9-12] A growing problem is that a substantial number of trainees suffer from diminished well-being and stress as a result of many different personal and work-related factors, which may lead to burnout or even drop out from PGME.[13-17] Motivation theories can explain how *intrapersonal* and *interpersonal* aspects influence motivation.[17-19] However, clinical working environments include additional elements that may support trainees' motivation that do not necessarily fit contemporary motivational theories. We need to better understand the interplay between trainees and the clinical workplace to facilitate trainees to grow and stay healthy and engaged.

Motivation is important for healthy development, learning, persistence and well-being.[9,11,20,21] We define motivation as psychological states or processes that provide energy and direction, which move people to act, develop and perform.[21] Motivation is, therefore, goal-directed and is shaped by individuals' interpretations and evaluations of activities and expectancies about the future. Contemporary motivation theories aim to explain and understand human behaviour through these psychological processes, with self-determination theory (SDT) being most frequently used in medical education.[7,10,11,18] Although motivational theories differ, most theories use the concept of competence as an important construct for motivation. Competence can be defined as a "condition or quality of effectiveness, ability, sufficiency or success."[8] Beliefs and expectancies about competence are constructed by the individual in interaction with the social environment. These *intrapersonal* (ie individual) and *interpersonal* (ie social environment) aspects that influence motivation and human behaviour are taken into consideration in many studies and theories about motivation.[7,12]

Motivation receives more and more attention in medical education research,[7,11,18,20] albeit focusing predominantly on personal and social aspects of motivation. Intrapersonal aspects, for example, students' motivational profiles[11,22] or physicians' intrinsic motives, such as having medicine as a calling and perceiving medicine as personally rewarding work, were important for learning, performance, well-being or commitment.[23] Studies on interpersonal aspects show that a sense of freedom or control over time and work,[24] opportunities to learn and practice,[25] constructive feedback,[20] good collaboration and interaction with colleagues or supervisors,[1,24,25] and a good educational climate[25] may support motivation. Although interpersonal and intrapersonal aspects are important for motivation and learning, it seems plausible that other elements of the clinical environment may also influence motivation.

Clinical environments consist of many interacting elements, such as people, processes, procedures, rules, regulations and culture,[1,3,5] which makes them complex and dynamic.[6,26] Features of the clinical environment that are not strictly social are, for example, clinical setting (eg ambulatory, emergency or in-patient), physical context (eg location, weather or season), organisation of work (eg scheduling of work and hospital routines), resources (eg instruments and imaging techniques) and time (eg time of day and availability of time).[1,5,27] These features may affect how trainees interact with the environment and which learning opportunities arise. Learning from and through interaction with the clinical workplace may lead to motivating experiences when features of the clinical environment are congruent with trainees' personal goals, values and learning needs.

In this study, we will explore all aspects of the clinical environment that may support trainees' motivation and how trainees interact with this environment. We assume these aspects will not necessarily fit into contemporary motivation theories, such as SDT. In order to look beyond intra- and interpersonal aspects and also focus on aspects that may not involve people per se, we will use a systems approach.[26] This approach views situations holistically and assumes that all interacting elements of the environment, such as people, objects, procedures, specific settings, atmosphere and time of day, lead to individual interpretations of and reactions to specific situations.[26,28-30] This approach allows us to explore how trainees interpret and react to specific situations in the clinical workplace. Although we explicitly focus on environmental aspects that stimulate motivation, we are aware that environmental aspects can also be demotivating. The goal of this paper is to enrich our understanding of how motivation of trainees can be promoted. We aim to understand: (a) how aspects of the clinical environment support trainees' motivation, and (b) how trainees affect their environment to optimise their motivation.

2 | METHODS

2.1 | Design

We used a constructivist grounded theory (CGT) approach, particularly following the principles of purposive sampling, iteration, co-construction, constant comparison, open, focused and selective coding, and memo writing to explore how the relation between trainees and complex clinical environments influences their motivation. This is an appropriate approach for exploring social phenomena that are not well understood and complex in nature, such as aspects of the clinical environment that may influence motivation. Within CGT, both participants and researchers play a role in data creation.[31,32] In this study, we used a combination of a visual method and interviews to explore participants' perspectives.[33,34] The interdisciplinary nature of our research team contributed to the initial richness and interpretation of the data. Our team consisted of: WEvdG, an educational advisor in PGME with a background in psychology and educational sciences; SMC, a systems engineer and medical education scientist with expertise in CGT and visual methods; MAdCF,

an internal/emergency medicine specialist with 20 years of experience in teaching and supervising undergraduate and postgraduate medical trainees; ADCJ, a research leader in medical education with expertise in qualitative research methods; and EH, an elderly care physician with expertise in CGT and visual methods. EH, ADCJ and SMC hold a PhD in health professions education and MAdCF holds a post-doctorate position in health professions education.

2.2 | Participants and ethical approval

In the Netherlands, undergraduate medical training has a duration of 6 years, starting with three bachelor years (pre-clinical phase) and followed by three master years that consist of rotational clinical clerkships (clinical phase). After graduation, some junior doctors directly start postgraduate training. Often, however, Dutch junior doctors work as residents not-in-training within a specialty of their choice or complete a PhD programme before they apply for postgraduate training. Dutch PGME programmes have an average duration of 4-6 years and use the Canadian Medical Education Directives for Specialists (CanMEDS) framework. Recently, PGME programmes have been implementing entrustable professional activities (EPA's),[35] which allow trainees to increasingly individualise their training.

For this study, 15 participants were purposefully sampled to cover a range of possible motivating experiences. Training stage (first or second year), PGME programme (surgical and non-surgical), gender (males and females) and previous work experience were considered in order to include a varied population of trainees who worked in a diverse range of clinical workplaces. Training stage was taken into account because junior trainees experience and need to learn to work in various clinical settings. WEvdG recruited participants from one educational region of the Netherlands by e-mail. Through contact persons within each hospital, mainly educational advisors for postgraduate training who are in close contact with the trainees that work in their hospital, trainees were approached. When a trainee was interested in participating, they could contact WEvdG by e-mail for additional information and to schedule an appointment. Between May and September 2017, trainees from six different hospitals, one university medical centre and five general teaching hospitals participated in our study.

All participants were informed about the study and provided signed informed consent. Participation was voluntary and anonymity was guaranteed. The interview setting, including date, time of day and location, was determined by the participants. Afterwards, participants received a box of chocolates for their participation. Because of the potential influence of rewards on motivation, we did not mention this reward beforehand. Ethical approval was obtained from the Dutch Association of Medical Education (NVMO, file #844).

2.3 | Data collection

To explore motivating situations in clinical practice, we used a combination of rich pictures, a visual method and semi-structured interviews. Visual methods are useful for making experiences that are not easy to explore or verbalise more explicit. The rich pictures method, a pictorial representation of a situation, stems from systems engineering and allows individuals to use all kinds of symbols, metaphors, interactions and diagrams in their drawing to make explicit how they engage with complex situations.[29,34] This also includes thoughts, emotions, behaviours and interactions between people and objects in the environment. All aspects and representations are drawn from the perspective of the drawer. This method uses a holistic approach, which means that individuals are viewed in relation to the environments in which they interact.[26,29] The drawing session before the interview stimulated participants to reflect on previous experiences, whether they were good at drawing or not, and may have helped them to organise their thoughts and emotions that were related to the drawn situation. The semi-structured interviews were used to thoroughly explore individuals' perspectives on the situation they had just drawn. The combination of methods we used helped us triangulate the data, which allowed us to better understand different aspects of the situation.

After explaining the purpose of the study, WEvdG, asked the participants to draw a rich picture of a situation in the clinical workplace that was motivating to them. We defined a motivating situation as something trainees experienced in their training that positively affected them, gave them a boost of energy or stimulated their persistence to continue PGME training. Participants chose which clinical situation they perceived as motivating. WEvdG, instructed the participants that the quality of the drawing was not important. Stick-figures as well as artistic drawings were suitable for drawing a rich picture. Participants were invited to draw all aspects of the situation that mattered to them, such as objects, people, emotions, metaphors and beliefs.[29,34] They had 30 minutes to draw their rich picture. Afterwards, they were interviewed about the content and meaning of their drawing by WEvdG to explore their interpretation of the situation and stimulate the ongoing reflection of participants on their experiences. The interviews had an average duration of 45 minutes. All interviews were held in Dutch and audiotaped and transcribed verbatim. Participants' background information was obtained using a short questionnaire.

During the process of data collection, we refined the interview protocol and added questions about trainees' struggles during the first stage of specialty training and how they overcame these struggles (eg "What kind of difficulties did you encounter in this period?" and "How did you manage to navigate through this environment in your first year of training?") and why they had chosen their specialty.

2.4 | Data analysis

We employed a systematic and iterative process of collecting and analysing data, meaning that we frequently moved back and forth between data collection and data analysis to broaden and refine the ongoing analysis. The interview was the first step of data interpretation and analysis carried out in co-construction between the

participant and WEvdG.[34] Thereafter, the interview transcripts and drawings were analysed by the authors (WEvdG, SMC, ADCJ and MAdCFEH). We used constant comparison to analyse the drawings and interview transcripts.[31,36] Also, insights from and initial analyses of previous interviews were used in subsequent interviews to further explore and gather additional perspectives from the participants. Data analysis continued until no new insights were derived from our data and we felt we captured the aspects of the environment that may support motivation of junior trainees. During the data collection and analysis process, WEvdG wrote memos to describe the interview context, review the interview process, document emerging themes and summarise discussions of the research team. WEvdG and EH held weekly meetings to discuss the data.

The interview transcripts were analysed in three stages: (i) initial, line-by-line, open coding of the first three transcripts (eg summarise each sentence in a short code, such as "being a team member," "performing a surgical procedure" or "receiving feedback"); (ii) focused coding of all transcripts, including constant comparison of new data with previously analysed data, and categorising and sorting the data into categories (eg merge codes into broad categories that summarise the individual codes and code the transcripts by using these categories, such as "getting opportunities to learn," "working in a team" or "providing good patient care"), and (iii) selective coding aimed at exploring the relations between different categories of codes to refine the emerging constructs (eg interpretation of the meaning of the data, such as "Which people support trainees motivation and why and when is this perceived as motivating by the trainee?," "What is it that trainees do when they need to focus and how is this perceived as motivating?") and develop a framework that is grounded in our data.

In parallel with the analysis of the transcripts, the rich pictures were analysed in four sessions.[34] All four sessions were audiotaped to facilitate data analysis. In the first three sessions, the drawings were displayed on a table and the characteristics (eg use of colour, people, objects and use of metaphors) and content (eg characteristics of the situation) of the drawings were discussed. In the first session ADCJ, EH and WEvdG discussed four drawings to familiarise themselves with the content and quality of the rich pictures and discuss their interpretations. In the second and third session, EH, MAdCF and WEvdG discussed 10 drawings in depth from a clinical perspective, aiming to understand the specific situations depicted. During these sessions, three categories emerged that reflected participants' experiences (doing, thinking and interacting with others). We discussed the role of the environment together with participants' influence on the environment. To enrich our interpretation of the drawings, WEvdG explicitly studied the related parts of the interview transcripts. In the fourth session, we performed a gallery walk. A gallery walk is a technique that stimulates active interaction with and discussions about the meaning of the drawings.[37] During the gallery walk, all 15 drawings were displayed in a room. All members of the research team participated and walked around the room engaging themselves with the drawings. The different motifs we identified in the drawings and overall interpretations of the whole dataset were discussed from a predominantly educational perspective. During this gallery walk, the authors reflected on the categories of participants' experiences (doing, thinking and interacting with others) and related these experiences with different aspects of the clinical environment that were depicted in the drawings. This resulted in four dimensions (ie social, organisational, technical and physical) that covered many aspects of the visualised experiences. Subsequently, these dimensions were further elaborated by WEvdG by making diagrams and mind maps—in which the interview and visual data were interpreted and related to the concepts of the four dimensions – to construct a coherent story about the data and examine whether these dimensions summarised the data sufficiently.

ATLAS.ti software, version 8 (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany), memo writing and group discussions were used to support data organisation and management. As all interviews were in Dutch, WEvdG and EH translated the quotes into English. Subsequently, the quotes were checked and discussed within the research team to refine their semantic and conceptual meaning. The Standards for Reporting Qualitative Research[38] were used to improve the clarity of our reported qualitative study.

3 | RESULTS

A total of 15 trainees (Table 1) drew situations involving tasks they enjoyed doing, which, in their perception, really mattered for their learning or for patient care. Trainees' ages (25-33 years) and

TABLE 1 Demographics

Participant	Gender	Age	PGY	Specialty
P1	M	26	1	Surgical[a]
P2	M	28	1	Surgical[a]
P3	M	33	1	Surgical[a]
P4	F	31	1	Non-surgical[b]
P5	F	27	1	Non-surgical[b]
P6	F	30	2	Surgical[a]
P7	F	29	2	Non-surgical[b]
P8	F	28	1	Non-surgical[b]
P9	F	26	1	Surgical[a]
P10	F	29	1	Non-surgical[b]
P11	F	28	1	Non-surgical[b]
P12	M	31	1	Non-surgical[b]
P13	M	25	1	Surgical[a]
P14	M	32	1	Non-surgical[b]
P15	F	25	1	Non-surgical[b]

[a]Surgical specialties: dental surgery; orthopaedics; general surgery; ear-nose-throat surgery; cardiothoracic surgery, and gynaecology.
[b]Non-surgical specialties: internal medicine; rehabilitation medicine; neurology, and hospitalist medicine.
Abbreviations: PGY, postgraduate year.

previous work experience as a doctor before they entered PGME (0-72 months) differed, which was beneficial for collecting diverse experiences about the clinical environment. The different training programmes and training stages covered a broad range of clinical workplaces where trainees worked and learned. We identified four dimensions of the clinical environment that supported trainees' motivation for learning and patient care (Figure 1): (i) social interactions, including interpersonal relationships; (ii) organisational features of the clinical environment, including work processes and procedures; (iii) technical possibilities of the clinical environment, including tools and artefacts; and (iv) physical space, which included characteristics of the physical environment. We found a reciprocal relationship between trainees and the environment, indicating that the environment affected trainees' motivation, but that trainees themselves also modified aspects of the clinical environment to optimise their motivation for learning and patient care.

3.1 | Social interactions

3.1.1 | The environment influencing trainees

Many social interactions were depicted in the drawings (Figure 2). Social interactions were perceived as motivating when trainees felt connected to other people, were able to receive or ask for feedback about their functioning and learning, or were able to negotiate autonomous clinical practice with others. Both health care professionals, such as supervisors, nurses, peers and interns, and patients supported trainees' motivation. Supervisors were important role models who supported trainees' motivation when they provided them with learning opportunities, gave them constructive as well as positive feedback and paid explicit attention to their learning. Other health care professionals supported trainees in managing tasks in line with their current level of skills and competence, thereby creating a safe environment in which to practice and learn. This quote from a surgical trainee illustrates how an operating room assistant supported him:
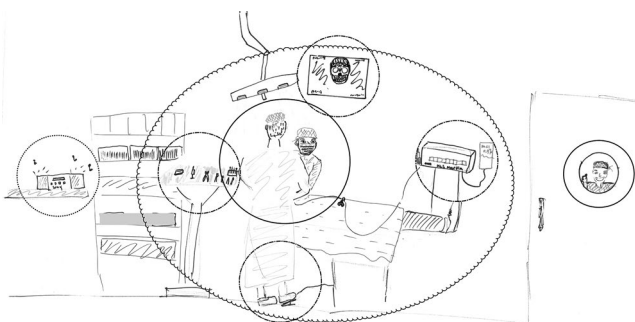

FIGURE 1 Different dimensions of the clinical environment that support motivation. The solid circles illustrate the social interactions. The "wavy circle" illustrates the organisational features. The "long dash dot circles" (._._.) illustrate the technical possibilities. The "dotted circle" (...) illustrates the physical space

Monitoring, taking it easy, so you don't feel rushed, but, um, yes, that they are also thinking along with you. I think we have a very safe working environment, so you're not afraid to ask questions. And at some point, you have to be able to trust each other. And if you overlook certain things, that you just, sometimes things are not going well and smooth and then you get the feeling "hey, I get the sweats," that there's someone around who can keep calm and manage certain things, someone who doesn't panic herself not knowing what she, what she needs to do, so to speak. That feels, that feels safe.

(P3)

Peers played an important role in informal social contact and support. Most trainees felt confident to ask their peers for advice, felt that they were all in this together and felt a sense of belonging. This was motivating, because the trainees could relate to each other, share experiences without any high stakes and really pay attention to each other's lives. This quote from a trainee illustrates when she goes to her peers for advice:

If there is something [you are struggling with] and you are thinking "do I really need to call my supervisor for this?"

(P11)

Another trainee describes how peers support each other:

Just pat each other on the back or encourage each other. And, of course, towards colleagues, towards each other [peers], um, yes, it's just happening much faster and sooner. And I feel that it's always after finishing the night shift. Then there'll always be some colleagues who are asking you "How are you doing? How did it go?" Or, um, "Have you got any plans for your days off?"

(P7)

3.1.2 | Trainees influencing the environment

When trainees influenced the social environment to facilitate their motivation to learn, they did this by taking the lead in patient care or asking for feedback. This was motivating to them, because it stimulated their self-confidence as a physician, but also provided them with information about the way they functioned in clinical practice. One trainee described why he had tuned his behaviour to suit his supervisors' needs and how it motivated him:

[...] they have a certain way of interacting and if you try to go along with them, then, um, they will trust you more easily and teach you more. At least, that's my experience. [...] And then you know that you're on the same page with someone and then, then it's easier and you'll also learn more. And then, um, you get positive feedback and that,

FIGURE 2 Social interactions. This picture illustrates many social interactions that were motivating for this trainee. The left part of the picture shows close collaboration with nurses and the involvement of the team with the patient and her partner. The top right illustrates the connection between the trainee and the patient's family. The bottom right illustrates that the trainee received positive feedback by phone from her supervisor afterwards

of course, also increases your motivation. So actually, you have to make sure to, yes, what I always do is trying to be on the same page with everyone involved, so they value you. That way they'll be more accessible to you and they won't be quick to say "I'll just do it myself." That's how it works and I like it.

(P2)

3.2 | Organisational features

3.2.1 | The environment influencing trainees

Trainees often used metaphors to visualise organisational features. For example, they visualised features about the time of day or the type of shift they had worked by drawing the moon and stars or clocks (Figure 3A). Figure 3B illustrates some organisational features of a specific type of night shift where a trainee is allowed to sleep at home, but is required to be available on call in case of an emergency. Organisational features enhanced trainees' motivation, especially when processes and procedures went smoothly and were in line with trainees' learning needs. This occurred, for example, when trainees were scheduled to work in specific clinical settings (eg the operating

theatre, an out-patient clinic, day or night shifts) to practise and expand their skills, were given the freedom to take the lead in a clinical team or were given the opportunity to investigate how the health care system works. One trainee described how organisational features supported his motivation compared to the time prior to his enrolment in postgraduate training:

Um, yes, um, now they give you the opportunity to do something, instead of creating learning opportunities by yourself. Of course, um, at that time I went to the operating theatre after work and, um, now they'll just schedule me in.

(P2)

3.2.2 | Trainees influencing the environment

Trainees provided some concrete examples of how they influenced the organisational dimension to optimise their motivation. Some trainees participated in quality and safety projects because they were interested in understanding how health care works and what they could do to improve the quality or organisation of care. Others tried to change and improve their schedule of rotations and shifts to

facilitate their motivation. As an example, some trainees preferred working the night shift, whereas others preferred working in an operating theatre. This allowed trainees to work more autonomously and better focus on their work:

> I enjoy working night shifts, which are less busy and chaotic. [...] But also just because of the silence and quietness compared to day shifts, that it doesn't bring chaos. And that's what I prefer at night, because during daytime hours you'll have many, um, um, yes you'll have many [different kinds of] interns around. Everybody walks in and out and then it's such a chaos
>
> (P7)

3.3 | Technical possibilities

3.3.1 | The environment influencing trainees

Technical possibilities were visualised as concrete tools, such as telephones, computed tomography (CT) scans, magnetic resonance imaging (MRI) and surgical instruments. Trainees' motivation was supported by the technical possibilities of the

environment when technical tools helped them understand patients' problems or provided them with feedback. Remarkably, trainees drew situations in which they themselves were using instruments and tools or receiving feedback through technical devices. In addition, tools and telephones in particular, were utilised for being in contact with supervisors to easily discuss ideas and thoughts. Technical possibilities supported trainees' need for autonomy as well as competence, because technical tools and instruments helped them diagnose patient illness or injury and check whether their clinical reasoning was sound. The following example illustrates how a smartphone, as a technical tool, makes it easier for supervisors to contact trainees and give them feedback, even after working hours (Figure 4):

> Later, in the evening of a working day [when I was at home], I received a WhatsApp message from one of the supervisors who was on call. He sent me a picture from an operating theatre. [...] Um, confirming my previous observations. And, actually that was the positive moment I really enjoyed and was excited about. This is what motivates me to continue.
>
> (P6)

This situation was perceived as motivating by the trainee, because this supervisor took the time to provide feedback by sending her a text message containing a picture, especially because earlier that day the supervisors did not have any time to provide trainee feedback. This example illustrates how technical devices such as smartphones could be used as a resource to support trainees' learning and consequently stimulate their motivation.

Another trainee described how imaging techniques are not only important to make the correct diagnosis for a patient with neurological problems, but are also an important source of motivation:

> And now we're going to do, um, a MRI scan. And then I'm very curious to see what comes out of it, so that excites me.
>
> (P14)

FIGURE 3 A, Organisational features represented as "the moon and stars" (left) and a "clock" (right). B, This figure shows a trainee on call who is diagnosing an acutely ill patient at around 2 A.M. This picture illustrates that the nurse and anaesthesiologist (on the right) were already present in the hospital, as is visualised by their working clothes. The trainee was called in from home, as is visualised by her casual clothes and bag
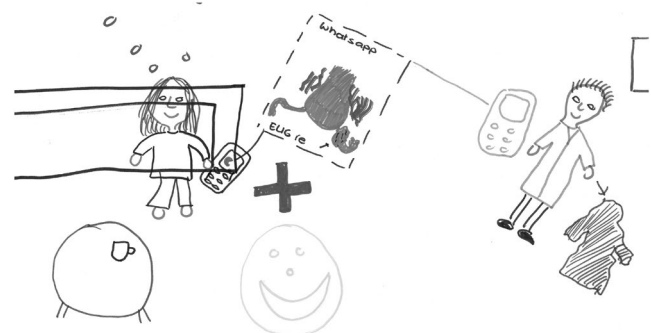

FIGURE 4 Technical possibilities. A trainee received a WhatsApp message from her supervisor that confirmed that her clinical reasoning earlier that day was correct

3.3.2 | Trainees interacting with the environment

When trainees were allowed to use technical tools they often felt competent and in control of the situation. Trainees explicitly depicted these tools in their drawings; for example, Figure 3B shows an ENT (ear, nose and throat) trainee who is using an instrument to look into the patient's throat to diagnose an acutely ill patient. Another example is displayed in Figure 1, showing an operating theatre where the trainee is independently using a peddle and surgical instruments.

In the interviews, they talked about the value of creating these experiences for themselves; for instance, a neurology trainee, who drew herself with a neurological hammer in her hand, explained:

> *The fact that I was able to find out that something was wrong, with consequences for the patient, through a neurological examination, eh. Then I felt very competent, which was motivating.*
>
> *(P11)*

An orthopaedic trainee described why it was motivating to practise and increase his surgical skills as often as possible:

> *It's not that I'm only motivated for the largest surgical procedures. [...] With almost all procedures, or maybe just all procedures that I do, I want to perform better each time. [...] It's also about learning how to handle tissues, um, handle the instruments, um, things like that.*
>
> *(P1)*

3.4 | Physical space

3.4.1 | The environment influencing trainees

The physical space was visible in the details of the drawings, such as a beautiful view in a patient room, curtains to create a private space or a radio playing music. The physical space could enhance trainees' experience of doing something valuable, something that really matters, which was motivating. The physical space could also support trainees' mental state, for example, when breaking bad news to patients (Figure 5A):

> *Yes, yes, um, well it was just a beautiful day and the sun was shining. And even though I was breaking bad news, yes, that light flooded into the room and well, yes, I don't know, it did something to me.*
>
> *(P5)*

Despite the bad news she had to break to the patient, the view in the patient room added to her experience that she was providing good patient care. The atmosphere she described was one of acceptance and peace, which helped her deliver the message, connect with the patient and her family and discuss a plan of action.
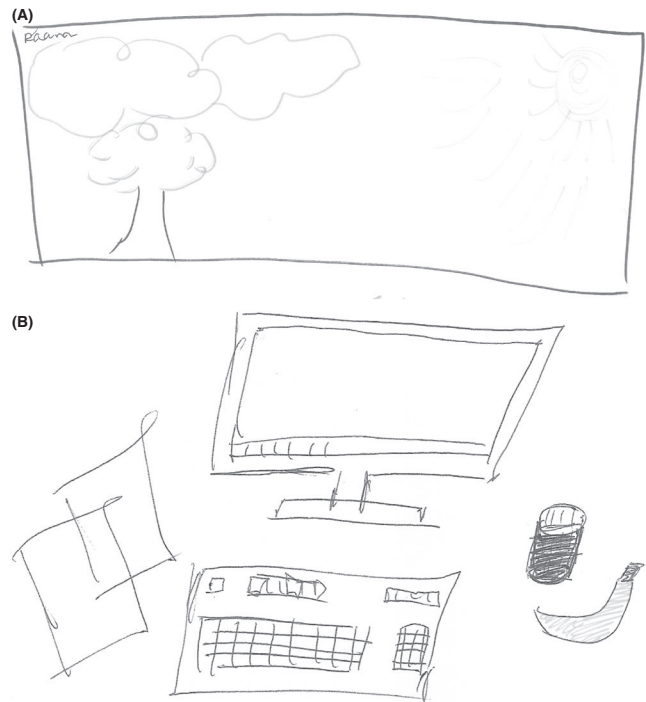
FIGURE 5 A, Physical space: a beautiful view that mentally supported a trainee when she was breaking bad news to a patient and her family. B, Illustration of the physical space of a personal workplace of a trainee

3.4.2 | Trainees influencing the environment

Trainees modified the physical space so they could focus on a task without being interrupted. Although most trainees did not explicitly mention how they used the physical space to optimise their motivation, some of them visualised aspects of the physical space in their drawings, such as closed curtains or elements of their personal workplace. Trainees also used the physical space to create spaces where they could withdraw to focus; for example, a trainee illustrated the function of a special room for trainees (Figure 5B):

> *It's a quiet place where you can sit down with a cup of coffee to complete your administrative tasks.*
>
> *(P8)*

In addition, this is an important space where trainees can meet their peers and share experiences without being interrupted or observed by others:

> *Sometimes, that's also important for colleagues who are having a hard time, so they can just sit down for a while. I know it works the other way around too, I can also take a break if I need to.*
>
> *(P8)*

This is especially important because trainees sometimes have to deal with difficult situations at work:

It's nice to let off some steam every once in a while.

(P8)

3.5 | Motivational dynamics

The four dimensions we found advanced our understanding of the motivational dynamics of the clinical environment. Different environmental dimensions and often interactions between them made situations motivating. Both trainees and other health care professionals could modify aspects of these dimensions, which led to motivating situations, especially when all dimensions complemented each other and the complexity of clinical practice was in line with trainees' level of competence.

Figure 1 illustrates how all dimensions together led to a challenging but not overwhelmingly complex situation for the trainee, which was therefore experienced as motivating. The positive support from the supervisor and an experienced operating room assistant created a safe learning environment. Although the procedure was challenging, the trainee felt competent to effectively use surgical tools, felt supported by the operating room assistant and felt that the atmosphere was good and not rushed, which was visualised as a radio playing music.

Figure 2 illustrates how a trainee took the lead in a clinical situation during a night shift, thereby actively managing the complexity of the situation. Despite a negative outcome for the patient, the resuscitation process went smoothly, the team was dedicated and she felt competent and autonomous to make decisions and lead the clinical team. She experienced this situation as very motivating and her motivation was further enhanced when she was able to connect with the family of the deceased patient afterwards. This was a valuable experience for her because she felt like she was doing something that really mattered. Furthermore, positive feedback the supervisor gave her by phone supported her feelings of autonomy and competence to handle similar situations in the future.

Although we specifically asked trainees to draw motivating situations, many of them also depicted demotivating aspects of the clinical environment, such as pressure to work quickly and without errors so their performance would be evaluated as good, frequent work interruptions or administrative tasks. Furthermore, some trainees experienced limited autonomy, felt unable to influence their training, felt dependent on their supervisors, feared looking incompetent or struggled to achieve the required competence. This was illustrated by a trainee:

Yes, that's generally the way it works. If you're behind schedule or, um, things are not going smoothly then, um, you will hear through back channels something like "yeah, the other [trainee] functions better" or "oh, I'm scheduled to work with him in the operating theatre. Oh no! Then it'll take such a long time [to finish]."

(P1)

Peers in particular but also other health care professionals could be a source of social comparison. A trainee described how social comparison undermined her self-confidence:

Um, I always feel that the others are at least as good or even better than me. In general, that's how I view my colleagues. I think they're all really good at their jobs. And, um, then I really hope that I, well, that I can achieve their high level [of performance].

(P10)

By contrast, another trainee experienced social comparison as motivating. He described the motivational value of the handover. For him, this was a setting where he could demonstrate his skills and abilities and compare his skills with those of others:

Yes, it's a kind of, um, comparison with everyone who's there. I always compare myself to others, yes. [...] That's motivating because then it's like "oh well, I still have to work on that" or "that's something I can improve," or, um, "that goes well, I'm able to do that whereas others are still struggling with it."

(P2)

Motivating dimensions could partially compensate for demotivating aspects of the environment. For example, a trainee illustrated how social interactions with a patient compensated for the chaos of daily clinical practice, especially because this particular patient thanked her for her care:

And that made me feel like, well, "this is what matters most, that someone who leaves the hospital is satisfied [with his treatment] and, um, that someone feels helped." And it's not about filling out treatment records and, um, keeping track of e-mails.

(P10)

4 | DISCUSSION

When trainees were asked to draw a motivating situation, they depicted experiences that not only supported their motivation to learn, but also supported their motivation to provide good patient care and connect with patients. Our study shows that different dimensions of the clinical environment—social interactions, organisational features, technical possibilities and physical space—are interconnected and support trainees' motivation. Our findings suggest that in complex environments such as clinical practice, it is important to take a holistic approach[26,29] to fully understand the influence of the environment on motivation. Therefore, it seems appropriate to consider more dimensions than the social environment[9,21] to explain motivational dynamics in PGME. Our findings are in line with other studies showing that multidimensionality of the clinical context is important for learning, performance and development.[1,3,26,33]

Trainees reported highly motivating experiences when all dimensions complemented each other. In such situations, they felt confident to perform the task at hand, strengthened in their competence and connected to others. This helped them thrive in challenging situations, expand their skills and remain determined to continue PGME. In turn, the trainees modified dimensions of the clinical environment to optimise their motivation, thereby showing their agentic engagement.[39] This interaction suggests that trainees actively aim to optimise their motivation and try to regulate aspects of the clinical environment to meet their internal values and learning needs.

Even though we asked trainees to draw motivating situations, many of them also depicted aspects of the clinical environment they perceived as demotivating. Some trainees struggled with managing their training or felt overwhelmed by the daily chaos of clinical practice, which had a negative impact on how they perceived their training and valued their work. Possibly, they felt a discrepancy between these aspects and their internal values. Our findings suggest that modifying aspects of other dimensions, such as personal attention, positive feedback and a separate room for trainees to focus on their task, could partly compensate for these demotivating aspects. A sense of belonging, of being seen and valued, may be particularly important in situations where trainees are facing demotivating aspects of the environment.

Modification of aspects of the clinical environment can be initiated by both trainees and other health care professionals. Trainees can modify their environment to create situations conducive to focusing on specific tasks without being overwhelmed by aspects of clinical practice they cannot cope with yet. This could reduce their cognitive load.[40] Other health care professionals, especially supervisors, can modify their environment to create a motivating work environment that provides enough support for junior trainees, tasks that correspond with trainees' level of competence and abilities, or a workplace that allows trainees to focus more effectively on their work. Our results suggest that effective modifications, including fine-tuning and balancing trainees' needs with the requirements of clinical practice, may result in clinical environments that match trainees' competencies and facilitate their motivation. Furthermore, it seems important that junior trainees become more aware that they can modify different aspects of the clinical environment to create better learning opportunities and optimise their motivation. This may result in practical implications for supervisors who wish to create supportive working environments for trainees and help trainees to become aware of how they can modify the clinical environment. Supervisors could actively help trainees to fit into clinical teams through formal and informal activities, build a trusting relationship for mutual understanding of the complexities of the clinical environment, provide trainees with tools and physical workplaces to work effectively, and allow trainees as much autonomy as possible in setting their work schedule and training.

Trainees' motivation is interwoven with their clinical environment. Tailoring clinical situations to meet the abilities and needs of individual trainees seems important to optimally support their motivation. Specific modification of clinical complexity by modifying different dimensions of the environment may generate valuable insights into learning environments that are motivating. Previous studies indicated a mismatch between trainees' and supervisors' perceptions of and preferences for trainees' autonomous practice.[25,41] In addition, trainees' preferences for supervisory style seem to change over time,[42] which implies that the relation between supervisory style and trainees' preferences should be taken into account. Modification of clinical complexity could help reduce this mismatch and improve the individual trainee-supervisor relationship. Future studies could shed light on the alignment between trainees' and supervisors' goals and expectations, which may help match the complexity of clinical tasks with trainees' levels of training to better support their motivation.

We collected experiences of trainees from teaching hospitals in one educational region of the Netherlands. All trainees were in their first years of training and were enrolled in different training programmes. Although we aimed to include a diverse sample of Dutch junior trainees to explore how dimensions of the clinical environment may support trainees' motivation, the sample in our study does not cover all training stages and training programmes. In addition, our Western context provided many organisational and technical possibilities and abundant resources that may not be present in other contexts. This limits the transferability of our findings to other training stages, programmes and non-Western contexts. Future studies could explore a more heterogeneous population of trainees, including different training phases, programmes, contexts and countries, to improve the transferability of our findings. In addition, motivational changes over time could be explored by performing a longitudinal study. This could help further enrich our understanding of motivational dynamics in PGME.

Inherent to the use of a constructivist grounded theory approach, the composition of our research team played a role in data analysis and interpretation. The varied backgrounds of the researchers helped to critically examine and interpret trainees' experiences from different perspectives. We believe that the results represent the data in a valuable way. However, we encourage other researchers to use different theoretical lenses or approaches to analysis to broaden our understanding of how the interplay between trainees and the clinical environment affects motivation.

In our opinion, the design with rich pictures is a strength of our study. However, by explicitly focusing on the clinical environment we may have omitted other important aspects such as individual characteristics, trainees' home situation or specific trainee–supervisor interactions. This may have slightly limited the transferability of our findings. By asking trainees to draw a specific situation, however, we stimulated them to reflect on every aspect of the clinical environment that supported their motivation. During the interviews, they were invited to further elaborate on their chosen situation and relate their experiences to other situations. This resulted in rich but also clear and practical descriptions of trainees' motivation within a clinical context, which added to our understanding of ways to empower trainees in their learning.

5 | CONCLUSIONS

Our study shows that trainees' motivation was influenced by the interplay between social, organisational, technical and physical dimensions of the clinical environment. Trainees experienced optimal motivating situations when all dimensions complemented each other. The situations they depicted appeared to be challenging but not overwhelmingly complex. Both trainees and other health care professionals can modify aspects of these dimensions to create a safe environment and optimal learning opportunities. We need to take all dimensions of the clinical context into account to understand motivational dynamics and support trainees to navigate through PGME.

AUTHOR CONTRIBUTION

WEvdG, ADCJ and EH designed the study. WEvdG collected the data and drafted the paper. All authors (WEvdG, SMC, MAdCF, ADCJ and EH) contributed to the data analysis and interpretation of the data, critically revised the paper, gave approval to the article and are accountable for all aspects of the work.

CONFLICTS OF INTEREST

None.

ETHICAL APPROVAL

Ethical approval was obtained from the Dutch Association of Medical Education (NVMO, file #844).

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