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# RESEARCH ARTICLE

DIRECT OBSERVATION

# A phenomenology of direct observation in residency: Is Miller's 'does' level observable?

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# **Abstract**

Introduction: Guidelines on direct observation (DO) present DO as an assessment of Miller's 'does' level, that is, the learner's ability to function independently in clinical situations. The literature, however, indicates that residents may behave 'inauthentically' when observed. To minimise this 'observer effect', learners are encouraged to 'do what they would normally do' so that they can receive feedback on their actual work behaviour. Recent phenomenological research on patients' experiences with DO challenges this approach; patients needed-and caused-some participation of the observing supervisor. Although guidelines advise supervisors to minimise their presence, we are poorly informed on how some deliberate supervisor participation affects residents' experience in DO situations. Therefore, we investigated what residents essentially experienced in DO situations.

Methods: We performed an interpretive phenomenological interview study, including six general practice (GP) residents. We collected and analysed our data, using the four phenomenological lenses of lived body, lived space, lived time and lived relationship. We grouped our open codes by interpreting what they revealed about common structures of residents' pre-reflective experiences.

Results: Residents experienced the observing supervisor not just as an observer or assessor. They also experienced them as both a senior colleague and as the patient's familiar GP, which led to many additional interactions. When residents tried to act as if the supervisor was not there, they could feel insecure and handicapped because the supervisor was there, changing the situation.

Discussion: Our results indicate that the 'observer effect' is much more material than was previously understood. Consequently, observing residents' 'authentic' behaviour at Miller's 'does' level, as if the supervisor was not there, seems impossible and a misleading concept: misleading, because it may frustrate residents and cause supervisors to neglect patients' and residents' needs in DO situations. We suggest that one-way DO is better replaced by bi-directional DO in working-and-learning-together sessions.

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# 1 | INTRODUCTION

Direct observation (DO) is a cornerstone of competency-based medical education (CBME); it is at the heart of workplace-based assessment (WBA) with its formative and summative purposes. 1,2 Yet the uptake of DO in postgraduate medical education (PGME) is poor. 1,3,4 The literature on DO in PGME provides ample explanations for this poor uptake, such as unclear stakes, fear of assessment, difficulties in interacting with patients and expectations concerning both autonomy and efficiency that conflict with asking for, or offering, observation. 3-12 One important recurring finding is the 'observer effect'. As Ladonna and colleagues found, observed residents felt as if they were 'staging a performance'; they behaved less naturally towards patients and 'they exchanged their 'usual' practice for a 'textbook' approach'. Feedback on this 'inauthentic behaviour' was not considered useful by these residents. 6

There can be no doubt that inauthentic behaviour is a serious threat to the value of DO as 'an assessment of "does" at the top of Miller's pyramid for assessing clinical competence'. 1,13 Assessment of the 'does' level is an assessment of the learner's ability to function independently in clinical situations. 13 In their guidelines on DO, Kogan and colleagues recognised that 'learners may default to inauthentic practice when being observed (e.g., not typing in the electronic health record when taking a patient history or doing a comprehensive physical exam when a more focused exam is appropriate)'. But the authors counter this problem by stating that 'observers should encourage learners to "do what they would normally do" so that learners can receive feedback on their actual work behaviour'. 1

To make this easier, according to the same guidelines, supervisors, while physically being in the situation, should be as little present as possible, for example, by sitting out of the patient's line of sight.<sup>1</sup>

This take on the supervisor's role, however, seems to conflict with our recent phenomenological research on *patients'* experiences in DO situations in general practice (GP) training. <sup>14</sup> Patients, for several reasons, needed—and indeed caused—supervisors to participate in the conversation to some extent. One of those reasons was that patients needed the senior's approval of the junior's approach. Taking this seriously would imply a movement in the opposite direction, where a supervisor judiciously participates in the activity, rather than keeping out of it as much as possible. <sup>14</sup>

This contrasting insight, however, is supported by only one study, on one perspective, that is, that of patients. High patients of patients of patients of patients, we obtained our understanding of the patients' perspective by following a phenomenological approach, meaning that we investigated regularities in what patients essentially experienced in DO situations. As Veen and Cianciolo advised, when facing persistent problems in medical education (such as the lack of DO in most training contexts), we should take a philosophical approach that 'empowers us to slow down when we should, thereby engaging us more directly with our subjects of study, revealing our assumptions, and helping us address vexing problems from a new angle'. Phenomenology is such an approach; it enabled us to see the discrepancy between what patients needed in DO situations and how medical education conceptualises DO. 1.14

similar phenomenological understanding of residents'(and supervisors') experiences in DO situations is lacking and needed to find answers to the questions that have arisen, based on a more complete understanding of DO situations from all perspectives. We, therefore, followed a phenomenological approach to investigate

the regularities in how residents essentially experienced working with a patient while a supervisor was physically present, observing them.

As indicated, DO is central to WBA.<sup>1,2</sup> A phenomenological approach, however, implicates investigating phenomena without predefining them, in terms of their purposes for example.<sup>16</sup> We therefore investigated DO situations as defined in the research question above, regardless of the purposes or other definitions of DO.

### 2 | METHODS

# 2.1 | Phenomenological approach

We performed a phenomenological interview study in one Dutch GP training centre.

Medical education literature often distinguishes *interpretive* (or *hermeneutic*) phenomenology from *descriptive* (or *transcendental*) phenomenology.<sup>17,18</sup> However, Rietmeijer and Veen proposed that, rather than subscribing to a specific school, authors should make clear how they understand phenomenology and how they applied principles of phenomenology in their study.<sup>16</sup> We now describe these principles and the methods we used.

# 2.1.1 | Common structures in pre-reflective experience

We investigated what residents experienced in DO situations before they had reflected on these situations: the 'pre-reflective experience'. Although investigating this pre-reflective experience is an unattainable ideal, our goal was to learn what participants' reflections, ideas and opinions revealed about the common structures of this pre-reflective experience. These common structures are also called regularities, or invariant structures, or essences of the experience. 16.19,20

# 2.1.2 | Open, theory-free; bracketing

We deliberately started this study without a theory on DO situations, for example, in terms of participants' roles, methods or goals. We focused on how the situation in itself occurred to residents. <sup>16</sup> In line with phenomenological principles, this open approach enabled us to see aspects of the phenomenon that would remain unnoticed had we pre-defined it and narrowed our object of interest. <sup>16</sup>

In order to attain this openness, we had to 'bracket' (= suspend) our 'natural attitude' towards our object of investigation. <sup>16,19–22</sup> With a natural attitude, <sup>21</sup> we would take our assumptions about relations between the resident, the patient, the supervisor and the DO situation for granted. In other words, before starting the interviews, we would already have predefined DO situations, for instance, as a teaching event, with particular roles for all the participants. With a phenomenological attitude, by contrast, we are precisely interested in participants' experiences of these relationships between themselves, the other participants and the situation. <sup>16,19–22</sup>

Although reflexivity on one's assumptions is common in all qualitative research, in phenomenology, bracketing goes further than that and means suspending theoretical and conceptual ideas that may narrow one's sight of the phenomenon. This is often referred to with Husserl's dictum 'to the things themselves'. Researchers must, therefore, constantly be aware of both their own natural attitude and the natural attitude of the interviewees. Bracketing was, consequently, equally important during the interviews and the analysis of them. This entailed constantly suspending opinions and theories about DO that arose and bringing them back to what they revealed about how residents experienced DO situations and what were the common structures of this experience.

Before starting the interviews, CBTR and SCMvE each wrote an essay on what they thought were important aspects of the experience of being the resident in a DO situation. In these essays, they also reflected on their natural attitude, what they tend to take for granted regarding DO situations, including findings from their previous research on DO. 10,11,14 They subsequently interviewed one another about these essays and used these reflections as the start of a reflexive diary and further memo writing throughout the interview and analysis period. As one example of what this exercise revealed, it appeared that both researchers were convinced that a junior doctor must learn from a senior doctor, with DO playing a role. However plausible this seems, by deliberately suspending this and other opinions/theories (e.g., as described in the introduction), they tried to become more sensitive in their interviews to see also other aspects of DO situations that contributed to residents' pre-reflective experience.

#### 2.2 | Context

We performed our interviews in the western part of the Netherlands. Dutch GP training is a competency-based, 3-year training programme; residents spend their first and final years in GP, working under the nearby supervision of one—sometimes two alternating—GP trainers. Residents visit their academic training institute 1 day each week for their day release programme. Supervisors and residents are increasingly encouraged by the training institute to engage in regular bidirectional DO sessions, taking turns being the doctor or the observer, during patient care. The take-up of this advice in practice, at the time of our interviews, was growing but still moderate. The authors did not work at the training institute and had no relationship with the residents interviewed.

#### 2.3 | Data collection

In 2021, we sent an email invitation to a total of 30 first- and thirdyear residents, randomly chosen, to be interviewed about their experiences in DO situations. Those who accepted were interviewed by either SCMvE or CBTR. The interviews took place via video calls because physical encounters were restricted because of the Covid 19 pandemic. The interviews were unstructured<sup>22</sup> in the sense that there were no pre-fixed questions other than the opening question: 'Can you tell me about a situation in which your supervisor was present in the room, observing you while you were working with a patient?' However, our aim of understanding the how of the experience did influence the type of questions that we used: We followed van Manen by deliberately looking for his 'existential elements of experience'. Van Manen claims that people experience things in their body (e.g., what they feel and what they do), in time (e.g., what happens when and how fast the time goes), in place (e.g., who sits where and position of furniture) and in relationship (e.g., familiarity with the patient and quality of the training relationship).<sup>20</sup> To get to the how of the experience, we asked guite factually what happened in specific DO situations, guided by these existential elements of experience.<sup>20,22</sup> The interviews varied in length from 60 to 75 min.

# 2.4 | Analysis

The interviews were videotaped. Both CBTR and SCMvE first—separately—analysed the video recordings holistically by capturing in one or two phrases what this interview told them about our topic (i.e., 'sententious phrases' [van Manen]).<sup>20</sup> They then transcribed and anonymised the interviews, and CBTR analysed these transcriptions in four rounds of coding through Van Manen's different lenses of lived body, lived space, lived time and lived relationship.<sup>20</sup> Using these four lenses made us more sensitive to all these aspects of the experience. It was an important step in the analysis. The aim of this, however, was to gain a more complete picture of the experience, not to describe the experience in four categories.<sup>20</sup> Therefore, in the results section, we will not report on these existential elements but will break down the pre-reflective experience in recurrent, or common, structures.<sup>16,19,20</sup>

CBTR grouped the codes by interpreting what they seemed to reveal about specific common structures of the pre-reflective experience (e.g., 'residents' awareness of the supervisor as an assessor'). He determined these common structures through a process of 'imaginative variation'. Imaginative variation means asking oneself if the experience would still be the same experience without this structure. If the answer was no, it was a common structure. <sup>16,20</sup>

CBTR wrote reflexive memos during this process. He then sent all this material to SCMvE who read the transcripts herself, commented on codes, code groups and memos, and added more codes and memos. SCMvE and CBTR discussed their findings during video calls, after each interview. After three and six interviews, PWT joined them in a meeting to review the analyses thus far. A further review of the

analyses took place in two meetings with the whole team, including MV, AHB, HEvdH and FS, who commented on examples of codes, code groups and memos and on the system of analysis.

# 3 | RESULTS

We interviewed a total of six residents, five of them in the second half of their first year, and one in her third year of the training. All residents had experience with being observed by their supervisor throughout a whole consultation. These DO sessions were intended to be formative. Most accounts we heard were about these scheduled DO situations, but some were about ad hoc observations when the supervisor was called in for advice during a consultation. We analysed the interviews by interpreting what they revealed about common structures of residents' pre-reflective experiences. We report on these common structures in the following paragraphs.

A first and obvious common structure was that in DO situations residents experienced being in a room with a patient *and* with a supervisor. Residents experienced verbal and non-verbal interactions between themselves and the patient and the supervisor, as well as interactions between the supervisor and the patient:

R2: So, then I feel that I have to work a bit harder, I'm almost doing like 'hallo!!' (waves her hand) [...] if the patient keeps talking to the supervisor [...] Then I think: I was supposed to do this conversation, but this way I'm not quite succeeding.

A second common structure in residents' pre-reflective experiences was that they experienced being observed by their supervisor while making an impression on both the supervisor and the patient:

R6: Well, but yes, you are very conscious of being in training and that, um, the patient forms an opinion of you, and that the supervisor forms an opinion of you [...].

Awareness of the impression they made on supervisors could make residents proud of their accomplishments:

R1: And then I thought, yeah, [...] this is going well, this is going well, this is going well, and I secretly thought like, oh, this is going nicely and I'm glad that my supervisor is here (and sees it).

This awareness of being observed could also make residents feel insecure and even handicapped compared with a not-observed consultation:

R6: Well, um, I feel that when I'm being observed I know less often what it is or what I have to do; and, normally, I would think of something, or make something up, but

if my supervisor is observing me, I'm afraid that I'll say the wrong things.

Feeling insecure and handicapped was most prominent when residents discussed the diagnosis and care plan with the patient:

R2: [...] concerning the diagnosis and how to handle this, if I am not entirely certain, I can't be very firm in saying we're going to do this [...] because perhaps the supervisor will interrupt and say that we're not going to do this at all [...] I found that very awkward to have to do.

Feeling insecure and/or handicapped could also relate to residents' personal way of interacting with patients:

R2: [...] that I wonder if my supervisor approves [...] that can concern multiple aspects, such as how I communicate with patients, I'm quite approachable and not so formal if possible, and then I hope that she will appreciate that too [...].

As another common structure of the experience, residents experienced their observing supervisor as a senior colleague and potential helper. This could lead residents to ask the supervisor's opinion, for the sake of optimal patient care, even if this was to the detriment of the impression they made on their supervisor as an independent worker:

R3: Especially the care plan, I want to have that checked at least. I don't want the patient to get less than optimal treatment when the expert, notably, was sitting beside me [...] I always have that conflict: this is an observation so I should act as if he wasn't there. But then I consult him anyway [...].

Also, residents often experienced their supervisor as the patient's familiar GP. This, too, could make residents engage their supervisor in the conversation:

R4: [...] I think that the patient likes that (when I discuss things with my supervisor) [...] because she sees that her own GP agrees.

Another common structure was the residents' experience of the position of the supervisor in the room:

- R3: Yes, it would have helped if she had sat more to the side, a bit behind me [...] Now I realise that she sat right between us [...] almost like a mediator [...].
- R5: Well he is really quite literally someone to lean on, someone who supports me, so if he did not sit behind me but to the side and further away, that would perhaps give me the feeling (of being in charge).

Strikingly, despite the disturbances resulting from the presence of the supervisor, residents often did experience the observation situation as an invitation, or assignment, to show how they work independently:

R1: [...] This was quite a good three-way conversation (with a patient and his son); my supervisor sat to the side, and he did not intervene, he, uh ..., he just observed, and uh... I did it all by myself [...].

Trying to work independently, as if they were alone with the patient, could cause many frustrations:

R5: When I get bogged down a bit, or lose the overview ..., if he were not there I would recover myself, [...] but, apparently, I mostly don't manage to recover when my supervisor is present.

R1: and that's ..., then you're not your best self, you're not functioning optimally [...] while you do wish you did, that's a paradox.

By contrast, some residents provided accounts of times when they did not experience DO situations as an assignment to show how they work independently; they could also interpret the situation as an opportunity to work and learn together with their supervisor, observing each other, which they valued:

R2: [...] I was inclined to turn the situation into a collaborative consultation [...] I like that, complementing each other [...] sparring about what would you do, and um, yeah, I thought that was fun [...].

Interestingly, this interpretation of the DO situation mostly arose spontaneously and was not agreed upon in advance with the supervisor.

As a last common structure of experience, residents had a pre-existing relationship with their supervisor based on previous experiences, which influenced how they experienced the DO situation:

R2: I could get along very well with this supervisor, we had a trusted relationship, so I didn't mind being observed by him.

# 4 | DISCUSSION

In order to advance our understanding of DO in general, and specifically concerning the 'observer effect', 'authentic behaviour', Miller's 'does' level and the participation of supervisors in DO situations, we investigated regularities in what residents pre-reflectively experienced in DO situations. Our results illuminate how an observing supervisor substantially changed the experience of residents and their behaviour,

compared with unobserved consultations. We will elaborate on this in the following paragraphs.

Ladonna and colleagues found that residents reported behaving 'inauthentically' under DO,6 thus not showing how they would work when not observed, that is, independently. 1,13 These authors held the observer effect responsible for this, which refers to acting differently when feeling observed and assessed. This observer effect, however, is often regarded as something that can be overcome, by encouraging residents to behave as they would normally do, 1 and by creating better DO conditions. 4,8,23 Such conditions comprise longitudinal. trusted, training relationships, recurring DO sessions with dedicated time and measures to promote residents' autonomy such as supervisors avoiding contact, including eye contact, with the patient by deliberately sitting to one side. 4,8,23,24 Our results confirm that these precautions may indeed help reduce distracting interactions and make residents feel more at ease. However, feeling more at ease and less distracted is not the same as being able to work 'authentically', or independently, as one would when the supervisor is not there.

We found that the observer effect that is caused by the presence of the supervisor did not allow for working independently because this effect was much more material than was previously understood: By being in the situation that was observed, the supervisor changed that situation in numerous ways with an inevitable impact on what the resident and patient experienced, felt and did. As one example, we found that residents were tempted to engage their supervisor in the conversation for the sake of optimal patient care and comfort, even if they would not have done so in an unobserved situation. For these residents, when the senior was in the room, it felt unnatural not to make use of their expertise. The familiarity of the patient with the supervisor, often their GP, was an additional reason for residents to engage their supervisor. Our previous study of patients' experiences<sup>14</sup> in DO situations indicated that patients also drew supervisors into the conversation, for the same reasons: the supervisor's seniority and/or familiarity with the patient. We conclude that the observer effect is not just about residents feeling observed and assessed; the presence of a supervising GP changes the situations to be observed in profound ways. Therefore, observing Miller's 'does' level, defined as observing how a resident works independently, 1,13 seems impossible.

We found that residents often struggled with this: They experienced the expectations of the supervisor, or the programme, as needing to show how they work independently, while they simultaneously experienced that this was impossible, and even undesirable in the interests of good patient care. Residents who coped with this by complying with the expectations and trying to work as independently as possible reported many impediments and frustrations. Previous research also highlights that DO often brings about uncomfortable situations and awkwardness for all three participants: residents, patients and supervisors. 3,6,9-11,25 We add to this literature that one of the causes for this may be found in the discrepancy between patients' and residents' needs for the participation of the supervisor on the one hand, and the DO guidelines-driven supervisors' and residents' attempts to keep the supervisor out of the conversation, 1 on the other.

# 4.1 | Practical implications

Although this study was not about assessment, our findings may have implications for WBA.<sup>26,27</sup> How do we collect the data we need for assessing our residents' competence? How can we be certain that a resident is becoming an independently competent GP or medical specialist? How does PGME live up to its societal accountability? Must we not assess residents with a certain degree of distance and objectivity? These are common and valid questions in medical education; more so in the CBME era.<sup>26</sup>

Our results, however, question the feasibility of this distanced observing of independent competence. As shown, what observers observe is, at least in part, caused by their presence. In the natural sciences, we would speak of artefacts. This helps us see that the wish for an 'objective', distanced, judgement of a resident's performance actually reveals a natural scientist, that is, a (post-) positivist attitude. In social constructivism, however, these artefacts can be valid starting points for a dialogue concerning their meaning for the resident's learning trajectory. This resonates with the literature on feedback, in which the importance of dialogue is increasingly emphasised. Our results suggest that this dialogue should start with firmly establishing that what we have seen has no meaning in itself. Being clear about this instead of ambiguous, as was often reflected in our results, may relieve tensions in DO situations.

When we translate the above again to Miller's pyramid, <sup>13</sup> we will never see more than the 'shows how' level, which makes the 'does' level a construction that we build upon what we have observed and what we infer from other sources. Concerning these other sources, a growing body of knowledge supports new complementary ways of assessing the residents' progress in competence, derived from, for example, ethnography and phenomenology. <sup>32–34</sup>

As a last practical implication, our results suggest that residents and supervisors could improve their dialogue concerning the purpose of their being in the same room with a patient and how to proceed. Recent research in similar GP training settings confirms that residents and supervisors hardly discuss this. 10-12 An important factor for this dialogue appears to be that DO situations seem to work best for learning when DO is bi-directional and not foregrounded. 10.11 Residents and supervisors should therefore consider using DO situations to work and learn together while observing each other, collecting, sharing and together interpreting observational information along the way.

# 4.2 | Implications for future research

Our phenomenological research amongst residents and patients has contributed to the conceptualisation of DO in PGME, highlighting the inevitable participation of supervisors in the situations they observe. In this, a phenomenological investigation of *supervisors*' experiences in DO situations is yet an important missing piece.

The main contribution of this work to the literature is the new conceptualisation of the observer effect, not just as anxiety-provoking

but as a material alteration of the situation. Further research in other contexts is needed to confirm and/or improve this understanding.<sup>35</sup>

Moreover, we need more research on how information obtained from working and learning together sessions can best inform summative assessments of residents.

#### 4.3 | Limitations

We conducted our research in one Dutch GP training centre, limiting its transferability to other contexts. An important contextual factor to mention is that patients, in GP training, usually know their own GP, who is the resident's supervisor, better than they know the resident. This fact contributed to one of our findings: Residents experienced the presence of their supervisor as the patient's familiar GP. This could encourage them to engage the supervisor in the conversation. The other reason to engage the supervisor, their seniority, will probably apply to education contexts in most health professions.

A second limitation is that this is a small interview study in only one context: a GP training centre in the Netherlands. In phenomenological research, however, small numbers of participants often suffice to attain meaningful, though not exhaustive, results. As van Manen puts it: 'Every phenomenological topic can always be taken up again and explored for dimensions of original meaning and aspects of meaningfulness'.<sup>20</sup> Also, the validity of inductively obtained theory is not determined by its quantitative underpinning per se but by its usefulness in different contexts,<sup>35</sup> which needs to be determined further.

# 5 | CONCLUSION

Our results indicate that the 'observer effect' is much more material than was previously understood. Consequently, observing residents' 'authentic' behaviour at Miller's 'does' level, as if the supervisor was not there, seems—theoretically and practically—impossible and a misleading concept: misleading because it invited residents to do the impossible: to work as if the supervisor was not there while he/she was there and substantially changed the situation, with all the reported associated problems and distress; misleading also because it made supervisors try to avoid participating in the situation, thereby potentially neglecting patients' and residents' needs; and misleading, finally, because it made residents and supervisors waste opportunities for educating and learning.

Based on our results and previous findings, we suggest that when a resident and a supervisor are together in one room, engaged in patient care, one-way DO is better replaced by bi-directional DO in working-and-learning-together sessions.

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#### **CONFLICTS OF INTEREST**

None

#### ETHICAL APPROVAL

The study protocol was approved by the ethics review committee of the Netherlands Association for Medical Education (NVMO) NERB file number: 2020.2.7.

#### **AUTHOR CONTRIBUTIONS**

Chris B. T. Rietmeijer is the first researcher; he led all steps of the design of the study, data collection, coding, further analysis and interpretation of the data. He wrote all versions for revision and comments by the other authors and processed all comments until the final manuscript. He agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Suzanne C. M. van Esch contributed substantially to the conception and design of the study; she performed half of the interviews, helped analyse and code the video recordings and transcripts and helped in further interpretation of the data. She revised the subsequent versions of the manuscript for important intellectual content. She gave her final approval of the version to be published and agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Annette H. Blankenstein contributed substantially to the conception and design of the study; she helped analyse the transcripts and helped in further interpretation of the data. She revised the subsequent versions of the manuscript for important intellectual content. She gave her final approval of the version to be published and agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Henriëtte E. van der Horst contributed substantially to the conception and design of the study; she helped analyse the transcripts and helped in further interpretation of the data. She revised the subsequent versions of the manuscript for important intellectual content. She gave her final approval of the version to be published and agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Mario Veen contributed substantially to the conception and design of the study; he helped analyse the transcripts and helped in further interpretation of the data. He revised the subsequent versions of the manuscript for important intellectual content. He gave his final approval of the version to be published and agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Fedde Scheele contributed substantially to the conception and design of the study; he helped analyse the transcripts and helped in further interpretation of the data. He revised the subsequent versions of the manuscript for important intellectual content. He gave his final approval of the version to be published and agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or

integrity of any part of the work are appropriately investigated and resolved. Pim W. Teunissen contributed substantially to the conception and design of the study; he helped analyse the transcripts and helped in further interpretation of the data. He revised the subsequent versions of the manuscript for important intellectual content. He gave his final approval of the version to be published and agrees to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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