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The value of virtual simulation in training GP residents in advance care planning conversations

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ABSTRACT

Introduction: Advance care planning (ACP) aims at empowering patients with chronic progressive disease to express and communicate their preferences for future care, but is not yet consistently applied in general practice. We explored GP residents' experiences with practicing ACP conversations through virtual simulation and its educational value.

Methods: Our study with Dutch GP residents in their first year of training used a hermeneutic phenomenological approach. Eleven participants were observed while engaging in virtual simulation, followed by an in-depth interview. Data was analysed in an iterative manner, starting from the first interview.

Results: Although the virtual simulation was mostly experienced as not realistic because it lacked the possibility of nuanced wording and personal adjustments, the GP residents did find it valuable to learn what topics can be addressed and how. The learning experience was primarily shaped by GP residents' prior real-life ACP experiences.

Discussion: Virtual simulation is a valuable part of a blended curriculum, facilitating residents to get started with or refresh the basic knowledge and skills of ACP. It is crucial that virtual simulation is followed by critical reflection with peers and supervising GPs and practice with actors or real patients to ensure GP residents can further develop their skills regarding ACP conversations.

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Introduction

Advance care planning (ACP) is essential to achieve patient-centred and proactive care and to ensure quality of life for the ageing population and patients with chronic-progressive diseases [1–3]. ACP conversations empower them to express and communicate their values, goals, and preferences for future medical care [4,5]. General practitioners (GPs) are the preferred healthcare professionals for initiating and conducting ACP conversations [6–8]. They therefore need to acquire adequate skills and attitudes to engage in these discussions effectively. ACP is often perceived as complicated and can cause discomfort and reluctance in both patients and professionals [8–11], highlighting the need for tailored communication training for GP residents [12–16].

Virtual simulation is promising for training various skills in health professions education (HPE) [17–21]. It can be cost- and time-effective, sustainable and scalable,

provides immediate feedback, and creates a safe learning environment [20]. However, its applicability is uncertain [17,19], especially for the skills needed for the intricate ACP conversations.

Few studies have evaluated virtual simulation in training ACP conversations or other complex communication skills, focusing only [12,22] on quantitative evaluation of subjective perceptions and attitudes [19]. Evaluation of learning transfer and experiences with qualitative research methods is rare [19] but particularly valuable for ACP training, due to the intricate nature of ACP and the emotions, assumptions and personal experiences of professionals and patients involved. Therefore, our evaluation questions are: How do GP residents experience practicing ACP conversations through virtual simulation and what could these experiences mean for the value of virtual simulation in learning ACP conversations?

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Method

Study design

Between June and December 2023, we performed a qualitative interview study with GP residents using a hermeneutic phenomenological approach. Observation of the GP resident engaged in the virtual simulation was immediately followed by an in-depth, semi-structured interview. The study was declared exempt from the 'Medical Research Involving Human Subject Act' by the Medical Ethical Review Committee of Leiden, Den Haag and Delft (Nr. 23-3025; date: 16 February 2023).

Setting

First-year GP residents from a primary care department at an academic medical centre in the Netherlands were invited to participate in this study. GP residents spend one day at the educational institution and the rest of the week working in a general practice under the supervision of a certified GP. The GP residents had completed an introductory module on care for older persons and palliative care. This included face-to-face sessions on clinical reasoning in palliative care, the normal dying process, residents' personal experiences with death, as well as problem identification and treatment plan development in older people. GP residents were also made aware of an optional e-learning module on treatment wishes conversations [23]. This module covers key principles such as when to initiate the conversation, communication tips, how to begin, follow-up questions and essential discussion points for the conversation. It was designed in a more traditional format, primarily featuring informative texts interspersed with open-ended and multiple choice questions and video examples.

Recruitment of participants

The GP residents of the September 2023 cohort ($n = 52$) were recruited during a department's vocational training day. Researcher WT explained the topic and study procedures. Interested residents ($n = 16$) received an information letter and a link to a digital informed consent form and a short questionnaire to collect background data by email (Supplementary file 1). WT scheduled the simulation session and subsequent interview with residents who consented to participate. We anticipated 10–15 interviewees would be sufficient to answer our research questions [24,25]. Participants received a -15 euro voucher for their participation.

The virtual simulation

The virtual simulation in our study was designed for an intervention study [26] in which GPs and other primary health care professionals were trained in one of two approaches to involving their patients with dementia in ACP. One approach focused on concrete treatment orders [27], the other on general care goals [28]. In the current study, we integrated these two approaches in two cases, including an initial and a follow-up conversation. The learning goal of the virtual simulation for GP residents was to practice ACP conversations with a virtual patient and to increase motivation to engage in real-life ACP. Prior to the current study, this virtual simulation was pilot tested with 13 third-year GP residents to identify potential technical issues, adjust content as needed, and gather input on the study method. This led to minor content adjustments and informed the decision to recruit first-year GP residents for the current study.

In each of the virtual simulations (Supplementary file 2), participants read an introduction about the patient, the background, and the events leading up to the patient's son requesting an ACP conversation. Participants then enter a virtual consultation room and assume the perspective of the doctor seated at a table with the patient and the patient's son on the opposite side. A conversation unfolds between the doctor and the patient in which the participant selects an answer or response from two or three options, triggering a specific reaction from the patient. The patient in the room makes gestures and changes facial expressions during the conversation. The case concludes with an overview of the patient's and the doctor's responses, accompanied by generic (not individually tailored) recommendations.

Hermeneutic phenomenology

Hermeneutic phenomenology goes beyond the description of the universal essence of a phenomenon (phenomenology) to the interpretation of that phenomenon. Hermeneutic phenomenology believes that the way individuals experience a phenomenon is influenced by their background, and their experience must be interpreted through this contextual lens [29–31]. Therefore, in addition to describing *what* and *how* it was experienced, we aimed to deepen our understanding [31] and interpret the experience by using a hermeneutic phenomenological approach in the data collection and

analysis. We chose a hermeneutic phenomenological approach to fit the intricate subject of ACP and the complex setting of the GP residency. This approach aided us to understand why their experiences were perceived as they were, and we expected that it could facilitate the translation of these insights to practice.

Reflexivity

Lead researcher WT, a third-year PhD candidate and medical doctor, conducted all interviews and took the lead in data analysis. Although not directly involved in the GP training, WT's familiarity with ACP, the GP setting and qualitative interviewing facilitated an open and comfortable environment for participants and enriched data interpretation. Multiple discussions

within the research team were organised throughout the research (Figure 1). The research team included individuals with a range of experience in medical education and ACP research as well as clinical and non-clinical backgrounds. We also sought advice from an experienced medical education researcher on the design, data collection and data analysis.

Data collection

WT conducted interviews at the educational institution or at the participant's GP practice, depending on their preference. First, the participant completed the virtual simulation exercise while being observed by WT. Non-verbal cues, such as expressions of emotion (e.g. surprise or confusion) and behavioural indicators of

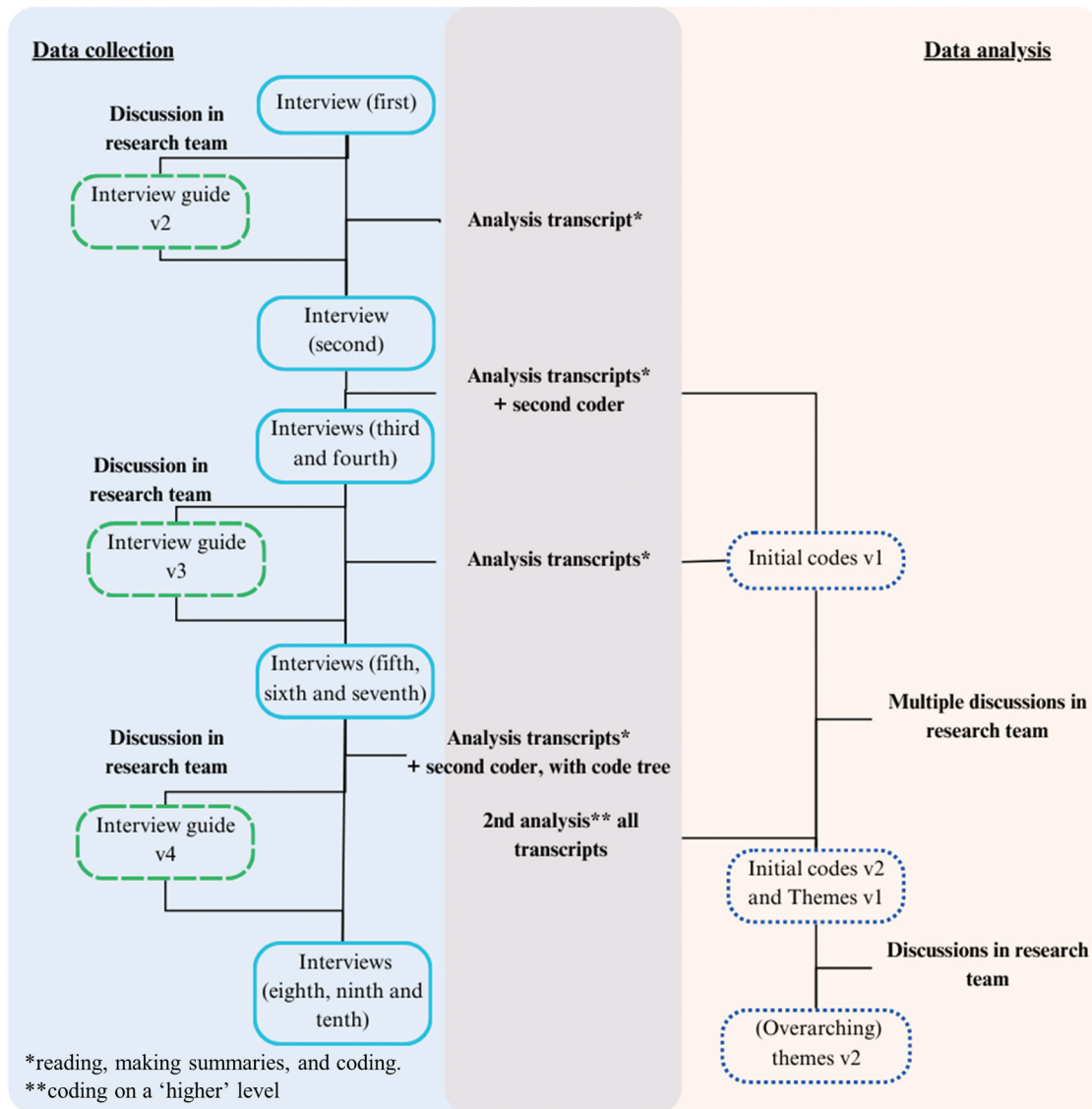


Figure 1. Data collection and analysis.

engagement, and any verbal comments made by the participant, were noted, functioning primarily as a facilitative tool in the interview process afterwards to probe more deeply into the participants' experience. Next, WT interviewed the participant based on an interview guide (Supplemental file 3), focusing first on the participant's experiences while engaging with the virtual simulation, utilising the observations. These observations proved invaluable for the interview, offering important insights that informed the development of questions to ask during the interview and helped to uncover the responses and reactions elicited by the simulation. For instance, the researcher asked, 'At the beginning of the conversation in the virtual simulation, you smiled; can you elaborate on that?' Second, participants were asked about their learning experience and how it could be transferred to clinical practice. Throughout, the researcher used various prompts (e.g. 'can you tell me more?', 'what do you mean by ...?') to participants to share their thoughts, feelings and emotions. To maintain a natural flow of conversation, the sequence of the topics was flexible. Based on insights gained from the interviews and discussions within the research group, the interview guide was modified (Figure 1, Supplementary file 3). Interviews lasted 30–60 minutes.

Data analysis

The interviews were audio recorded, transcribed verbatim and entered into qualitative data analysis software (Atlas.ti version 22). We analysed the data iteratively (Figure 1). Analysis of the transcripts was primarily conducted by WT and included reading, highlighting, writing interpretative summaries, inductive coding,

dwelling in the data; pondering, wondering, and asking questions of meaning and meditative thinking regarding the stories; questioning and thinking to provide a bubbling up of the patterns and themes that interpret the experience [31]. Three of the 11 interviews were coded separately by second coder JAB. Regular meetings were held with the research team to discuss evolving themes.

Results

We interviewed 11 participants, as after the final three interviews, the existing themes remained. Table 1 provides a summary of participants' backgrounds.

The emerging themes were categorised guided by the research questions regarding the simulation experience and the learning experience. Themes from the simulation experience were unified under the overarching theme of 'the virtual simulation experience is shaped by the complex nature of an ACP conversation'. Themes from the learning experience were unified under 'the learning experience is shaped by the individual's experience with and knowledge of ACP' (Figure 2).

The virtual simulation experience is shaped by the complex nature of an ACP conversation

The virtual simulation experience

The complex nature of ACP conversations affects the virtual simulation experience, particularly the level of engagement and sense of reality. For participants, the virtual simulation did not feel like their own conversation; the relatively rigid format, with its predetermined course of the conversation, left limited room for their own input, which led to

Table 1. Participants' backgrounds.

	Total (n = 11)
Sex: female	8
male	3
Age: in years, range	26–33
Previous work experience: in years, range	2–7
Previous location of work (multiple answers possible): n	
General practice	3
Nursing home	4
Accident and Emergency care, Internal medicine, Geriatrics, Pediatrics	11
Public health	3
Previous self-perceived experience in conducting ACP in practice*: n	
Moderate experience**	4
Limited experience***	4
No experience	3

*assessed by an open-ended question 'What are your experiences with conducting proactive care planning conversations (Dutch terminology of ACP) in practice?', supplemented by the main researchers' assessment during the interview.

**participants who had conducted ACP conversations more often and similar to those in the virtual simulation, particularly within a primary care setting.

***participants who had engaged in only 1 or 2 ACP conversations in practice or in distinctly different, protocolised conversations only, typically in an acute care setting.

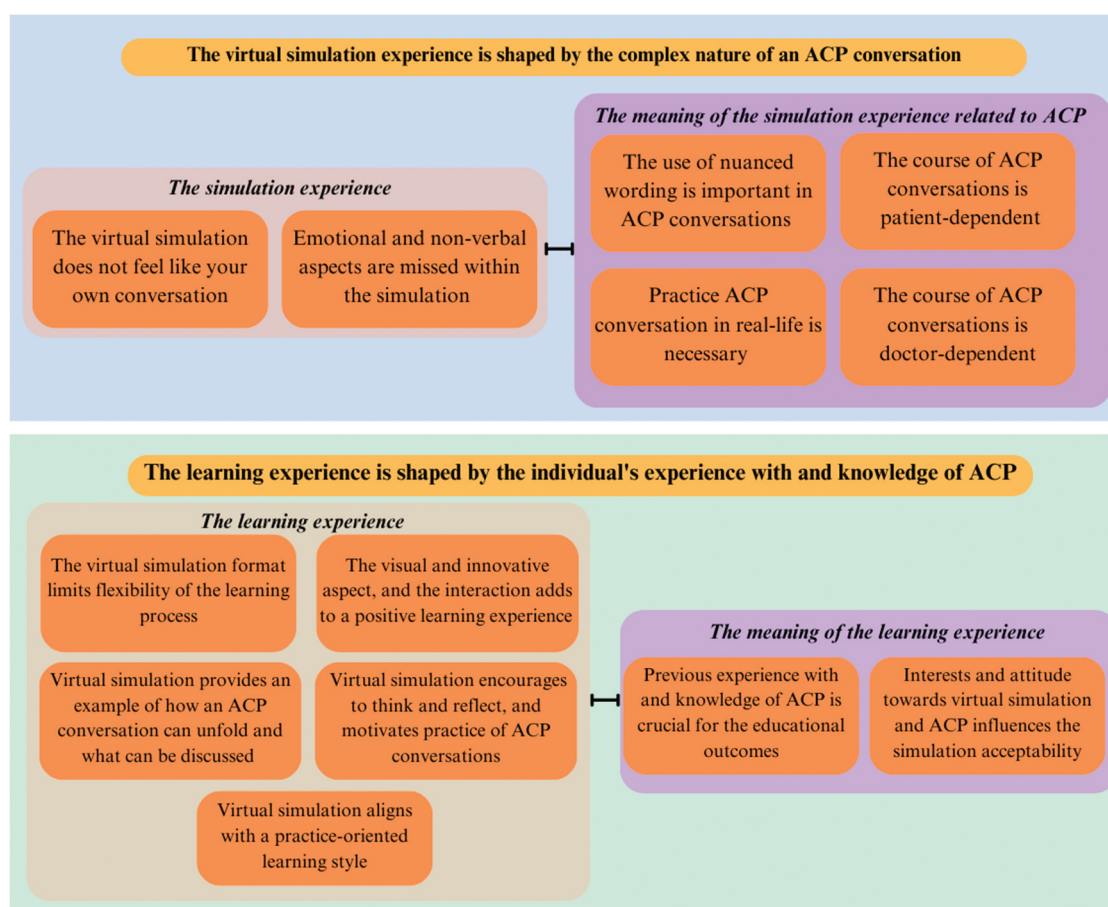


Figure 2. The identified themes regarding the simulation experience and the learning experience.

decreased engagement and a less realistic experience. For example: *‘At the end, I didn’t feel like it was my conversation, because it would take me longer to get to the core of the ACP conversation’* (participant 9, moderate ACP experience), or *‘this just isn’t my style’* (participant 3, moderate ACP experience).

Additionally, participants missed real-life emotional and non-verbal elements in the simulation:

But here, in a [real-life] consultation room, well, you obviously see, or sense if someone is sad. You feel whether someone is affected or not, and [in the simulation] I don’t feel that. So the text is all you have [...] you don’t see actual facial expressions. – participant 4. (limited ACP experience)

The meaning of the virtual simulation experience

These experiences were mainly shaped by the complexity of an ACP conversation, which was not always reflected in the virtual simulation. The

importance of nuanced language and the patient-dependent course in ACP conversations was emphasised. For example: *‘To a vulnerable older lady with a frail voice, you’d give slightly less complicated information than to a lady with a really strong voice, where you think, “Oh well, she has everything under control”’* (participant 14, limited ACP experience).

The majority of participants (eight out of eleven) noted that ACP conversations also depend on the individual doctor.

Because, when you are discussing life or death, it’s ultimately about you. How do you see life, and death? And what is important to you? I think it’s very important that people retain their autonomy, so that’s what I strive to achieve. – participant 3 (moderate ACP experienced)

Finally, almost all participants (nine out of eleven) mentioned the necessity to practice ACP conversations in real life.

The learning experience is mainly defined by the person, s experience with and knowledge of ACP

The learning experience

Five organising themes were identified in the data related to the GP residents' learning experience throughout the virtual simulation (Figure 2).

First, participants perceived a limited contribution to their own learning process due to the format, requiring them to select responses from a few options:

[...] you just use what's presented to you. [...]. Instead of thinking about my next step in the conversation, you choose from sentences that are presented to you [...] So your brain is not busy having a conversation, it's making choices, I think. - participant 12 (no ACP experience)

Additionally, when none of the response options aligned with their preferences, participants felt this negatively influenced their learning.

Second, ten out of eleven participants mentioned the positive impact of the visual and innovative aspects and the virtual interaction on their learning experience:

It's more enjoyable than an ordinary e-module where you just read a story [...] It's more lively, you see the patient talking, and you get to choose your response [...] it makes you want to continue and see how the conversation unfolds [...] So, you're more actively involved in the learning process. - participant 9 (moderate ACP experience)

Third, participants emphasised that the virtual simulation served as an example of how an ACP conversation could unfold and what topics might be addressed:

I found it quite helpful to go through the whole conversation like this, exploring which strategies you can use to approach it. Also, it gave some examples of phrases you can use to open the conversation. I thought those examples were really nice, very good. - participant 8 (limited ACP experience)

Also, it allows participants to experiment with questions they would not normally ask.

Furthermore, the majority (ten out of eleven) of the participants observed that the virtual simulation encouraged thinking and reflection:

There are things you recognize and things where you think, oh yes, but this may also be important to consider, so you're really encouraged to think about it. - participant 14 (limited ACP experience)

Also, it motivated them to practice ACP conversations in general practice, for example: 'I could imagine, thinking, "Oh, I'll have to do this myself at some point and use this"' (participant 8, limited ACP

experience). Three participants requested the conversation aid mentioned in the virtual simulation.

Finally, nine out of eleven participants expressed that their practice-oriented learning style aligned well with the virtual simulation. For example: 'You should not make me read books, it doesn't work well, but things like this, they resonate much better'. - participant 15 (limited ACP experience).

The meaning of the learning experience

The learning experience was shaped by specific characteristics of the participants, in particular their previous experience with and knowledge of ACP, but also their interests and attitudes towards digital education.

First, previous experience and knowledge of ACP was related to the educational outcomes. Participants had different levels of familiarity with ACP conversations and expressed different learning needs. Participants with limited experience expressed learning needs related to guidance on what topics to discuss and examples of phrases to use, and found the virtual simulation very informative. Moderately experienced participants expressed other learning needs such as conducting more advanced ACP conversations in real life (possibly with a practice supervisor as observer), learning about preferred timing to initiate ACP, and practicing how to involve family members.

If you've had conversations like this before, practicing with an avatar might be a very different experience. Because you already have a strong opinion about how you've conducted them [...] Or maybe you've already developed your own way of doing it [...] And it may not be so easy to ignore that, I don't know. But if you approach it with an open mind, I just really liked it. - participant 11 (no ACP experience)

Furthermore, participants' interests and attitudes defined the learning experience. Several participants expressed a strong liking of e-learning in general. In addition, two participants expressed having certain expectations before the virtual simulation session (i.e. more advanced technology and graphics), of which most were not fully met.

Recommendations

The interviewees also provided recommendations for future simulation content and the potential integration of virtual simulation into GP training. These recommendations are summarised in Box 1.

BOX 1. Recommendations for content and use of virtual simulation*Content of virtual simulation*

- Expand response options for the doctor. Allow the doctor to make decisions about the topic of discussion; this enhances their influence on the course of the conversation.
- Allow the doctor to add typed or spoken responses rather than predetermined response options.
- Incorporate a role for family members in the simulation to enhance realism.
- Develop multiple cases with different patient scenarios to enrich the learning experience.

Integration of virtual simulation in GP training

- Use virtual simulation as a supplemental, preparatory tool for practicing real-life conversations in the general practice setting.
- Encourage plenary discussions with peers after the virtual simulation experience in the educational setting. Encourage GP trainees to engage in the virtual simulation together with the supervising GPs in practice and stimulate discussion afterwards.
- Ensure accessibility for quick and convenient use in practice. Provide a summary of the simulated conversation, including example sentences and practical tips.

Discussion

We explored the experiences of GP residents who practice ACP conversations through virtual simulation and what it could mean for the educational value of virtual simulation. GP residents experienced the virtual simulation as not always being realistic and engaging, primarily due to the complex nature of ACP conversations. Nevertheless, they perceived virtual simulation as a valuable tool for learning what topics can be addressed in ACP conversations and how. The meaning attributed to the experience and its value in learning ACP were primarily shaped by prior real-life experiences with ACP conversations. GP residents with limited or no ACP experience found the virtual simulation informative and helpful. GP residents with moderate experience in ACP conversations, expressed learning needs which did not align with the virtual simulation, and, although they still gained some useful insights, they found the virtual simulation of limited value for themselves.

Our findings corroborate previous findings on experiences with virtual simulation for training various types of communication skills, in particular the lack of diverse real-world scenarios and constraints on the doctor's self-expression [32,33]. Furthermore, the literature is consistent with our finding that virtual simulation is perceived as a supplemental, interactive method for learning the basics of a particular communication skill, but not as a substitute for real-life patient or actor interactions [18,33,34].

Resulting from our hermeneutic approach, we found that the educational intent of this virtual simulation tool, which was to practice ACP conversations with a virtual patient and to increase motivation to engage

in ACP, is most appropriate for GP residents with little or no previous ACP experience. More experienced residents benefit more from peer reflection on attitudes and beliefs towards complex and sensitive ACP topics such as mortality, end of life and death, combined with role-playing with actors or real patients [11,12,15,35], to overcome barriers engaging in ACP [11].

When considering the integration of educational technology into curricula, health professions educators should be guided by educational aspirations and pedagogical intent, rather than technological capabilities [17,19]. Kirkwood et al. highlighted that most educational technology is typically evaluated for quantitative improvements with a technology-centred focus, such as better test scores using pre-test/post-test experimental methods [19]. They stress the importance of including qualitative evaluations of learning to improve reflection on learning and learner engagement. Our study shows that qualitative evaluation provides more insight into learning experiences and needs than quantitative evaluation only, facilitating a more tailored approach to integration into the GP curriculum.

Strength and limitations

To our knowledge, this is the first study to explore experiences of virtual simulation in ACP using a hermeneutic phenomenological approach. Diversity in the sample of GP residents, observation of participants as they engaged with the virtual simulation and the hermeneutic phenomenological approach applied in data collection and analysis resulted in timely adjustments to the interview guide, rich data and facilitated translation to practice. Furthermore, the diverse experiences and backgrounds of the research

team supported effective recruitment, thoughtful design, and comprehensive data interpretation.

However, the use of this specific virtual simulation and its design, for example the limited conversation pathways, potentially influences our findings and their generalisability to other specific virtual simulation programmes. By framing the interview questions and interpreting the data in a broader context, we aimed to enable more general statements and recommendations for content of future simulations. Also, the possible bias caused by the involvement of JvdS and WT in the development of the virtual simulation should be mentioned. However, three other researchers who were not involved in the virtual simulation's development, were closely involved in data collection and analysis.

Implications

Virtual simulation offers an appealing and interactive learning method and can be a valuable supplemental tool for introducing ACP or refreshing the basics of ACP conversations in preparation for conversations in general practice, particularly for GP residents with little experience in ACP conversations. Its integration should be part of a blended curriculum design: virtual simulation can be used to get started with or refresh the basics of ACP remotely and should be followed by critical reflection sessions with peers or the supervising GP in general practice and real-life practice with actors or patients. This will ensure that residents can directly apply the knowledge they acquired in daily practice and that all GP residents, regardless of prior experience, can develop their ACP conversation skills.

Furthermore, while we acknowledge the impracticality of using a hermeneutic approach to evaluate educational interventions, due to its time-consuming nature and the expertise required, we recommend qualitative evaluation of educational interventions in daily HPE practice.

Future research

The next step involves exploring how virtual simulation and immersive virtual reality can transform, rather than complement, ACP education [17,19]. Future research should investigate the effects of more immersive technology that creates virtual environments where learners are even more engaged and provided with various response options and different patients to practice ACP conversations. Also, research is needed on new evaluation frameworks for HPE that allow critical evaluation of educational technologies for training complex

skills by using both quantitative and qualitative methods.

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Disclosure statement

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