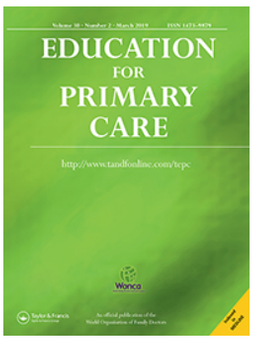

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RESEARCH ARTICLE

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Facilitators and barriers to brokering between research and care by senior clinical-scientists in general practice and elderly care medicine

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ABSTRACT

Background: Clinician-scientists (CSs) are physicians who work in daily care and have an academic role in research or education. They may act as knowledge brokers and help to connect research and clinical practice. There is no data available on CSs' brokering activities and the perceived barriers and facilitators to optimising their role in general practice (GP) and elderly care medicine (EM).
Aim: To identify the brokering activities of CSs in these fields and the barriers and facilitators they come across whilst sharing knowledge and connecting people in research and frontline health care.
Design and setting: Qualitative interview study among 17 Dutch senior CSs.
Method: Interview data were audio recorded, transcribed verbatim and thematic interpretative analysis was used to identify themes.
Results: CSs facilitate collaboration between researchers and practitioners. They exchange knowledge on both sides, make use of extensive networks and constantly and actively involve care in research and research in care. CSs come across barriers as well as facilitators that influence their brokering activities. Some barriers and facilitators are at the individual level, other are related more to the job context and workplace.
Conclusions: This study reveals barriers to overcome and facilitators to develop related to the brokering role of CSs. To make the best use of CSs, brokering activities and the added value of CSs should be recognised and supported. Awareness of what CSs need to function effectively in demanding work settings could be important for the future impact of the role on the fields of GP and EM.

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Clinician-scientist; general practice; elderly care medicine; brokering

Introduction

The worlds of research and clinical practice are not connected well, a concern that resonates in recent discussions worldwide on how to conduct research relevant to healthcare and how to incorporate evidence-based medicine (EBM) into daily practice [1,2]. Clinician-scientists (CSs) may play an important role in bridging this gap as these physicians combine clinical practice with research, enabling them to produce clinically relevant knowledge and disseminate evidence in clinical practice. The Netherlands, for example, has established six-year tracks to train CSs in general practice (GP) and elderly care medicine (EM) while also obtaining a PhD to enhance academic clinical practice in GP and EM. The work of GP and EM is quite comparable in The Netherlands. The track consists of an alternating three years of practice and research [3–5]. There are similar initiatives in the UK as well [6]. As we lack knowledge about brokering activities performed by CSs and competencies needed for that role, specific training in these tracks to learn how to perform such roles is still lacking. Professionals who connect people on both sides of a boundary or facilitate knowledge exchange between different worlds are called brokers. Therefore, CSs may act as knowledge brokers and the brokering activities they perform may help to connect both worlds.

Kislov has written an essay on the 'dark side' of knowledge brokering that reflects on the many challenges and tensions that hamper the effectiveness of brokering and bridging the gap between researchers and practitioners [7]. He describes the tensions between different aspects of brokering (i.e. gathering of information, exchanging of information and using it to improve patient outcomes), tensions between different types and sources of knowledge and tensions resulting from the in-between position of brokers. CSs often seem to be struggling to integrate

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the science and the institutional care logics in their day-to-day work [8,9]. In a systematic review, Bornbaum et al. have reported on the activities and tasks of knowledge brokers [10]. However, these authors conclude, knowledge brokering is context-specific and, because they included studies on brokers in diverse healthcare related settings, their results remain rather general. Although a number of initiatives in GP and EM aimed at improving academic capacity and quality of clinical practice are currently underway across Europe [3–5,11,12], there is no data available on CSs brokering activities and the perceived barriers and facilitators in these specific fields. Such data would give valuable insights into how to support CSs and how to prepare trainees for a role as a CS and enhance their future impact on their profession.

In this interview study, we aim to understand the brokering activities of senior CSs working in the field of GP and EM and to identify the barriers and facilitators they come across whilst connecting the worlds of care and research.

Methods

Given the explorative nature of the study, we used a qualitative research design and applied the standards for reporting qualitative research [13].

Participants

We interviewed 17 Dutch senior CSs for this study, following the ethical procedures of the Dutch Association for Medical Education (NVMO). The participants signed informed consent forms before the interviews. Sampling was purposive. Research participants were selected from the authors' own networks because of their current position as CSs. This was defined as working in GP or EM care for more than ten years as well as working in academic medicine (with a PhD degree) as a researcher or teacher or employed by the Dutch College of General Practitioners in the Guideline Department. Twenty-two CSs were invited to participate by email or in person by the interviewer, who did not know any of the CSs. Three participants did not respond and two appeared not to meet the above criteria for inclusion. The remaining participants represented a varied range of different academic and practice work settings, research experience after a PhD and involvement in GP, EM or PhD training.

Interviews

Data were collected through semi-structured interviews in Dutch that lasted between 45 and 75 minutes. The structure was based on a specially designed topic guide, following current literature [10], discussions with the multidisciplinary research team, and a pilot interview. The first two interviews were conducted by two researchers together (YB, DS) and were used to refine the topic guide and the interview process. They both did not know the CSs. The remaining 15 interviews were conducted by one researcher (DS). The interviews consisted of questions exploring the participants' brokering activities including the barriers and facilitators they encountered. Data collection took place in person between June and August 2017 at the participant's place of preference; in 14 cases this was the participant's (clinical or research) workplace and in three cases the participant's home. Interviews were audio recorded and transcribed verbatim.

Data analysis

All interview data were anonymised before analysis. The Dutch transcripts were uploaded in NVivo 11 and thematic interpretative analysis was used to identify emerging themes [14]. One researcher (EG) analysed three transcripts and created a code tree based on the emerging themes. The first draft of the code tree was discussed with two other researchers (MLB, YB). Next, MLB and EG analysed three random transcripts whilst using and adjusting the codes. Subsequently, all the researchers discussed the emerging themes and agreed on decisions made during the analysis to ensure interrater reliability of the coding procedure. Two researchers (MLB, EG) then independently analysed another three transcripts, compared those results and further refined the codes and themes until they agreed upon the final code tree. Thereafter, MLB coded the remaining transcripts. Because the researchers came from different backgrounds (qualitative research and clinical research as well as being educational and clinical practitioners) their collaboration on writing and conducting the research combined the benefits and strengths of their individual disciplines [15].

Reflexivity was maintained by the research team throughout the analysis and writing process by recoding, discussing and challenging established assumptions. Finally, the themes and quotes were translated from Dutch to English by a native English speaker.

Results

Table 1 shows the characteristics of the participants, 11 GPs and 6 elderly care physicians.

Table 1. Summary of participants' characteristics.

	N (%)
Sex	
Female	5 (29)
Male	12 (71)
Age in years	
30–39	3 (18)
40–49	5 (29)
50–59	5 (29)
60–69	4 (24)
Professional background	
General practitioner	11 (65)
Elderly care physician	6 (35)
Years since PhD	
< 8	7 (41)
≥ 8	10 (59)
Proportion of work week spent on academic activities	
≤ 0.4	9 (53)
> 0.4	8 (47)

Brokering activities

Four themes around brokering activities emerge from the data.

Theme 1: CSs facilitate collaboration between researchers and practitioners.

They feel responsible for connecting the ideas of researchers and practitioners. They bring them together, for instance, when thinking about new research projects.

CS12 *Yes, that's what I'm for, I'd say. Because it's about the ideas GPs have about using their data sensibly and the questions from clinical practice that the GPs think might be interesting to study, to connect these with the aims of researchers who want to set up projects that stay close to clinical practice. Now that doesn't always happen without help.*

CSs also facilitate collaboration on a practical level by inviting, convincing and enabling peer clinicians to participate in research projects.

CS17 *Now, you do come across a bit of resistance because the GPs think, oh I'd never be able to do research or I just don't have the time. So then I try [. . .]. Look, it's easy for me to speak cos I'm a GP myself, and I really understand the root of the problems, and I can counter the arguments because I usually know what the answers can be. So when people start talking about time restraints, I can tell them, for example, how we've arranged things in our practice to make it possible. So then, yeah, being not only a researcher but also a GP gives me a real advantage.*

CS6 *So with every little step of your research, I mean, as far as the practical implementation is concerned, I'm also thinking with my GP cap on: what would it be like if it happened in my own practice, what problems would I run into? And that means you can give advice on, for instance, how you could set up an intervention. How can you ensure that it will take as little time as possible and runs as efficiently as possible?*

Theme 2. CSs share their knowledge and information with both sides.

CSs discuss the relevance and implementation of research in clinical practice with the other researchers, who have no such clinical experience.

CS13 *I have some researchers, colleagues, who are not practising [GPs] and they ask me about my experience in practice, because they miss having that for themselves.*

CSs promote the evidence they use in their own clinical practice environment. Besides, they are asked for advice on interpreting the evidence by their clinical peers.

CS3 *But in the practice I want to stay off the, well. . . 'in my experience it's so and so. . .', or 'I've heard that so and so works'. I mean, it's expert opinion, but still hearsay, and you can just as well. . . well, there's a big world of publications and evidence-based medicine out there, where you can find a lot of clinically relevant answers. (. . .) And I am often asked, what's in the literature, they [practising colleagues in EM] know I have access to the literature. . . and the tools and skills to answer those questions from practice.*

Theme 3. CSs develop and use networks to be able to perform brokering activities.

Their networks include colleagues in clinical practice, academic colleagues and the many people around these workplaces who enable them to connect academia and care in many different but ongoing ways.

Theme 4. CSs undertake to involve and represent the other side in their working environments in any circumstance.

The following quotes illustrate this.

CS12 *[We] explore what people mean and what their options are. And comment on that. For the researchers [we act like the voice of] conscience for the relevance to practice. And in education, [we act like the voice of] conscience for the evidence-based content.*

CS9 *With every paper I write I always consider: if I gave a lecture to GPs now, I know their last question – sometimes even the first question – would be, 'Yes, but, what should I do tomorrow?'*

Barriers and facilitators

CSs come across barriers as well as facilitators that influence their brokering activities. Some factors are at the individual level whilst others are related more to the job context and workplace and are summarised as such at the situational level. Tables 2 and 3 present barriers and facilitators thematically with illustrative quotes.

Situational barriers are the constant struggles to obtain sufficient time and funding in a competitive world, with competitors working full time in research. Two part time functions add easily up to more than a full time one. Moreover, academic work ('an expensive hobby'), pays less than being a practitioner. However, there is the reassurance of being able to practise when the academic tasks can no longer be funded. Their colleagues in clinical practice and their superiors in academia do not always understand or lack awareness of all their activities and added value. They are not sufficiently supportive. The gap between practitioners in GP or EM and academia seems sometimes just too big.

When dedicated time (and money) is available to perform research, this clearly facilitates brokering activities. It is also helpful to have large networks and to act as a liaison officer connecting people and facilitating the exchange of knowledge on both sides; especially so when working with people with shared views. Support from the organisation and getting the flexibility you need as a CS helps, as does being respected and trusted as a broker.

Handling all competing priorities, managing all tasks and keeping everyone satisfied is challenging. Individual barriers, as mentioned, relate to feeling undervalued, falling between and not being able to cope with all responsibilities. As individual facilitators CSs mention that it is essential to belong to both worlds to be fully accepted as a broker and being able to add value. But you must be able to prioritise and to focus on the different perspectives. The CSs feel a strong responsibility for making research clinically relevant and practice evidence-based and to find inspiration in combining both worlds.

Discussion

CSs act as brokers between the academic and the clinical work floor in GP and EM. They strongly believe in the added value of being a CS, combining research and care to develop themselves and their profession in a meaningful way and to be a role model for future CSs. They feel responsible for taking up brokering activities to connect research and care in both settings and building bridges to connect people and promote knowledge sharing in networks spanning both worlds.

CSs aim to represent both worlds and be accepted by their peers on both sides, thus being able to influence them. When keeping up with all their different tasks, they actively and effectively share knowledge and connect people within their large networks in both worlds while successfully participating in and promoting clinically relevant research and evidence-based practice.

Strengths and limitations

The main strength of this study is that it gives important new insights into the brokering activities of a wide range of CSs in GP and EM and into the facilitators and barriers they come across in their daily work. The variety of CSs enabled identifying many barriers and limitations, and it did not seem there were many topics unmentioned as we experienced saturation on the emerging themes. A limitation might be that the participating senior CSs could have been more aware and reflective of their broker role than others and might be more active brokers.

Comparison with existing literature

Brokering activities thematically emerging from the interviews only partly align with the knowledge brokering activities mentioned earlier [10]. Many activities did not apply to these CSs. This confirms the notion that broker activities are context-specific. The brokers included in the Bornbaum review were mostly appointed as go-betweens. In our study of CSs working in both research and practice, the broker role is often not official and often not even explicit. Nevertheless, they do perform a range of brokering activities. In our study, an important theme, not previously described in the literature, was that CSs constantly and actively involve care and research in their daily work, out of responsibility

Table 2. Summary of situational and individual brokering barriers.

Situational barriers	Illustrative quote	Individual barriers	Illustrative quote
Time limitations	CS7: *It is extra hard though, having two employers. One and one often adds up to more than two; for instance, [having] two mail boxes. Something is always happening somewhere else that you have to keep up with.* CS9: *What I find the hardest is having to compete with researchers who are doing research five days a week.*	**Invisible or not valued**	CS6: *Who sees everything you do at the same time? I sometimes get the feeling [. . .], I think that more people can see it all, if you have an eye for it, but actually they are few and far between [. . .] So it's hard to get recognition for all your hard work.* CS15: *They don't see the added value for themselves. Even GPs in general merely see it as a hobby of mine and that irritates me more and more.*
Financial constraints	CS1: *Everyone said I was mad. Why are you going to work more for less pay? Well, ok, the inspiration is worth it.* CS6: *So you have to be financially self-sufficient; that's a very uncertain position to be in.* CS7: *We have far too few PhDs and we'd like to have more of these linking pin people, like me. But, there's a price tag involved, and [. . .] we don't have that much money.*	**Falling between two camps**	CS16: *You often feel misunderstood by the clinicians and researchers as well, because you've got that double appointment and therefore you won't always be available for certain things they plan to do together. Scheduling meetings or whatever. So that really is a difficult position.* CS9: *As for the bridge builders, they always stand in the middle, so to say. It's a strong metaphor, also for the certain amount of loneliness involved. It sounds a bit sad, and I don't really mean it to sound like you have two groups standing on either side and there you are [alone] on that bridge. That's not entirely true because I also feel a sense of connection with my peers on the clinician's [GP] side and maybe even more so with my peers on the researcher's side, but far fewer people do it like this.*
No corresponding interests	CS2: *GPs not involved in research themselves, they are just not interested. Nope, almost impossible. The gap is just too big.*	**Inadequacy because of dual responsibilities**	CS1: *Both professions demand perfection. And if you go for excellence, or in any case the very good, nothing is ever good enough. So nothing in clinical care is good enough. The vessel never gets full. And it's the same with research. So, you constantly have to navigate between what you need to do and what you can let go.*
No support from the organisation	CS9: *If they think it [a thing not directly related to research or patient care] is important, and I think it's important, then they have to make time for it. [. . .] In the end, during the annual interview, other things get considered. Then output gets considered.* CS3: *One of the most difficult problems is that EM has no measurement culture on the work floor. I mean a culture in which it is normal to conduct standard measurements at fixed times.*		
No support from peers	CS6: *But that's because colleagues don't accept you leaving early or that you do extra things, so I conform. But actually [I'm trying to] conform with an enormously divided world.*		
Competing priorities	CS6: *You have to organise your practice well. If you don't, your colleagues get upset and they'll sulk, so you have to do extremely well to get them willing to do the other things. Well, in research you have to be financially self-sufficient, so you also have to show you have added value and always keep that up. So you have to keep a lot of plates spinning.*		

for representing the other side in each setting. A few interviewees described this as acting as the conscience of research in care and vice versa. At the same time, some CSs mention that they feel that they fall between both worlds and are not able to focus all their attention on either clinical practice or research, in the same way their fulltime working peers can. This sense of inadequacy, imperfection and falling between two camps stresses the importance of acknowledging CSs as a separate position with status, visibility and brokering outcomes to be evaluated. This latter finding is important as there are many clinicians other than CSs involved in time consuming activities, such as quality improvement,

Table 3. Summary of situational and individual brokering facilitators.

Situational facilitators	Illustrative quote	Individual facilitators	Illustrative quote
Dedicated time	CS9: *I think that when you are facilitated [. . .] in hours and flexible working times. In the end it's just practical. If I can be facilitated [to get the hours I need], I can get it all done quite well.*	**Recognition and appreciation**	*CS14: We have a professor in GP, who does not practice. My colleagues won't accept anything he says because they think, 'who does he think he is?' I can see that. But the moment we say something, it's a completely other story, because, yeah, we're one of the guys, and we've made another step forward.* *CS12: I've always been easily heard. There must be something about me, apparently, that makes me really easy to hear. That is, well, I can't define it properly. Well, maybe it's because I'm interested in what drives someone and try to find a connection through that. It's a facilitating factor.*
Access to information, experts and peers in networks	CS1: *I've just arranged an appointment with one of my postdocs and one of my colleagues. She wants to recruit patients for a new study and it's quite complicated. So she wants to discuss how a GP could help in terms of recruitment.* CS3: *Technology can also help. For instance, as a researcher you have access to the medical library, so you can find far more evidence-based things than someone without that access.* CS6: *They come to me because they know I'm at that intersection. I have a network of GPs with special interests, so when it's to do with research they come to me. Being close to researchers lends confidence. At times I feel like a liaison officer, just connecting people.*	**Adding value in the dual role**	CS3: *It also helps them [on the work floor], because then they know more about the [wider] applicability of a scale that they use every day in practice.* CS12: *Education in particular is naturally a point of connection from where you can steer the application of developed knowledge into practice.* CS9: *Inclusion in particular, because inclusion always sucks in research, and research never understands why that is. But because you are in practice, you understand perfectly well.*
Corresponding and compatible interests	CS11: *That you can motivate people to do it, that you can convince them that it's important. That people can see that just practising solely as a GP won't take our profession forward.* CS17: *Well, the fact that you can talk about it with these people, that you know you're not the only one thinking like this. That you share a certain vision with a group of people gives you the strength, I think, to come out with that vision. And that increases your confidence. That's my main driver, I think. You know you didn't come up with it all alone, it's something shared.*	**Setting priorities**	CS9: *But I think you can't train yourself fast enough in keeping all those balls in the air [because] dealing with sub-optimality gets to be more and more of a hassle and that's what building bridges involves. At a certain time that sub-optimality doesn't have the same weight anymore and you start getting more of the added value.*
Multiple opportunities for interaction	CS1: *My position, I'm not a top researcher. I know a bit about lots of things; I'm a connector. I will never win the Nobel Prize. I have good ideas, but my job is connecting. I like to surround myself with the top researchers, who know a lot about a certain topic, and the clinicians, and then me. And then we happily connect and so on.*	**Switching perspectives**	CS6: *I have to focus, otherwise I can't combine it, because you'd be doing it all at the same time. So it's a way to let my brain focus on one thing, and because I can do that I can be good at it. So, on the one hand, it's because the organisation won't accept that you're in separate worlds and on the other, it's my way of being able to do it.* CS1: *They always joke about it and call out, 'There she goes again with all her hats on'. Because that's the way I work, I talk to them. I say, well I put on my GP hat or my research coordinator's hat or my researcher's hat. And then you can talk to them from different perspectives.*

(*Continued*)

Table 3. (Continued).

Situational facilitators	Illustrative quote	Individual facilitators	Illustrative quote
Support from organisation	CS13: *Yeah, exactly, that you feel that you can get the flexibility you need. Sometimes I need to go to a congress, or I have an important meeting, and it can be important for either research or patient care and then there has to be space in both workplaces so that I can make time for it. And if I think it's important they have to agree it is. And when you feel that you get the space [. . .], yeah, that's very nice.*	**Responsibility for making research clinically relevant and practice evidence-based**	CS15: *Well, I always feel like an ambassador. I'm always very aware that if your research doesn't reach the practice you've achieved nothing. Therefore, I actively participate in the guidelines, the European guidelines too, because you reach large groups that way.* CS1: *That I believed a great deal in the exchange between research and daily practice, that I envisioned a very important role for people who make sure that research is relevant for daily practice.* CS10: *Researchers less involved in practice, they think, yeah, just do it, why so make it so complicated? Well, because it is complicated.* CS14: *I see my task as bringing GP research forward, but more importantly, to give the core values of GP a more stable, far more stable foundation. That's why I do research.*
Culture of mutual respect and trust	CS11: *I have written a lot and always get very nice reactions. I notice that when I want to bring up something in practice in the role of researcher, it is highly appreciated. But also I notice that when I bring up my experience as a practitioner, that gets valued as well.*	**Need for self-development**	CS9: *It's enriching, it's lots of things. It feels rich to have the room to gain knowledge, to think about ideas, to execute those ideas, to meet interesting people and share ideas, to learn from others. It's nice having such a job, and even getting paid for doing it.*
		Inspiration for both clinical work and research	CS17: *I think that it's essential that we have people with one leg in practice and another in research, because if, as a researcher, you don't work in practice, you won't have a clue about what is going on in there and what you can or can't do. On the other hand, I've benefited so much from doing research, because as a GP you have very little time to go into great depth and as a researcher you can do that much more. Now I'm much more aware of topics than I was before, and that makes me grateful. So I think my position as a practitioner helps me as a researcher and my position as researcher helps me as a GP.* CS6: *So it keeps me in balance. So I think that because I do research I can be a nice GP on those two days; otherwise I wouldn't be such a nice GP anymore.*

management or education, equally struggling to compete with their full time working colleagues who might not see the general added value of these activities.

Brokering activities are facilitated by a flexible environment and individual skills like prioritising and focussing on all different tasks. Importantly, CSs have an enormous drive to keep developing themselves professionally and add knowledge to the GP or EM field. Their commitment to research and clinical practice is what makes CSs powerful.

Implications for research and practice

Appointing CSs seems an effective way to contribute to the call for more clinically relevant research [1]. This study reveals the barriers to overcome and facilitators to use. To make the best use of CSs, brokering activities and the added value of CSs should be recognised and supported. Other outcomes besides publication or awarded grants, such as the impact on GP or EM and the relevant networks involved, should be made more visible and be better facilitated by the organisations employing CSs. Organisations should rethink the use and value of brokering activities to enhance academic practice. Bearing in mind the concept of mindlines, the tacit knowledge of clinicians that is influenced by peers, CSs as brokers are important to enhance evidence-based practice [16]. The skills brokers need could be strengthened and further developed during CS training. This might enhance the programmes installed for CS training at

Bachelor degree level or after an MD [4,17–19]. Senior CSs see themselves as role models for future CSs. Strengthening awareness of the brokering role of CSs in organisations and what they need to function effectively and build resilience in demanding work settings, could be important for the future impact of the role on GP and EM.

Disclosure statement

No potential conflict of interest was reported by the authors.

Ethical consent

Ethical procedures of the Dutch Association for Medical Education (NVMO) were followed. Formal ethical approval is not mandated under Dutch law for this type of study.

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