

# How institutional logics shape the adoption of virtual reality in mental health care: A qualitative study

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## Abstract

**Objective:** To analyse institutional logics' role in adopting virtual reality in mental health care.

**Methods:** Data were collected via qualitative, semi-structured interviews with four frontline staff and seven administrative and service staff, two focus group interviews with three frontline staff and four administrative and service staff, and via participant observation in meetings between stakeholders working on virtual reality. Data were collected from May 2021 to February 2022, analysed using thematic analysis, and theoretically driven by the framework of Institutional logics.

**Results:** We identified two different forms of institutional logics being drawn upon by frontline staff and administrative and service staff, respectively, when working with the adoption of virtual reality in mental health care. Frontline staff drew mainly on a *Professional logic*; administrative and service staff drew on a *Diffusion logic*. Each logic defined a unique focal point, causal pathway, and perceptions of a meaningful adoption process for virtual reality.

**Conclusions:** By taking institutional logics as our theoretical and analytical point of departure, this study demonstrates how the meaning of virtual reality and its adoption in mental health care is grounded in multiple and sometimes conflicting institutional logics. Acknowledging the existence and influence of often multiple institutional logics in the adoption process is crucial to guide the future adoption of virtual reality in mental health care. Organising collaborative venues for stakeholders where their multiple institutional logics are made the subject of joint reflection is essential to counter frictions.

## Keywords

Psychiatry, implementation, virtual reality, mental health, qualitative study

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## Introduction

Virtual reality (VR) may be broadly understood as a three-dimensional (3D) computer-generated environment, allowing users to engage in immersive multisensory experiences using specified equipment (e.g., specialised head displays, hand-held controllers, and dedicated programmes). It allows users to engage in immersive settings, producing feelings of presence in selected environments.<sup>1</sup> These qualities mean that VR has gained increased focus in mental health care as a potentially important therapeutic instrument to accompany existing pharmacotherapy and psychotherapy treatments for psychiatric disorders by offering health professionals the possibility to test established mental

health treatments in a safe virtual environment.<sup>2</sup> VR exhibits positive outcomes when used as part of the treatment of post-traumatic stress disorder (PTSD),<sup>3</sup> phobia,<sup>4</sup>

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anxiety, depression<sup>5,6</sup> and when used as both an assessment-, therapeutic- and rehabilitation tool for psychosis treatment in mental health care settings.<sup>7,8</sup> Allowing such potential to emerge depends on a successful process of moving from specialised and often highly controlled research environments<sup>9</sup> towards use in an everyday mental health clinical setting.<sup>10</sup>

However, research suggests that adopting VR in future mental health practices could be challenging due to several well-known structural conditions such as costs, lack of support infrastructures, and relevant clinical training programmes.<sup>11,12</sup> Moreover, clinical concerns, disinterest, and lack of engagement may further prevent the adoption of VR as a clinical tool. It is, therefore, crucial to operationalise VR as a meaningful tool into the everyday understanding of professional roles and tasks to advance its adoption.<sup>10,12</sup> However, this requires a more profound knowledge of the vital processes that stakeholders engage in during the adoption process to make technology meaningful.

According to Greenhalgh et al.,<sup>13</sup> the clinical adoption of technologies such as VR involves a process of ongoing negotiations between networks of often multiple individuals within an organisation (See also literary works<sup>14,15</sup>). In these negotiation processes, different actors base their understandings on various 'institutional logics' understood as underlying rationales that guide what counts as meaningful behaviour and thus work to support or hinder the adoption of new technology in multiple ways.<sup>16–18</sup>

Current research strongly recommends studies to guide future implementation practices concerning VR.<sup>10</sup> Crucially, such studies need to accommodate the understandings and the practices of often multiple stakeholders such as administrative and service staff (ASS) and frontline health care professional staff (FS) involved in the process.<sup>1</sup> However, despite acknowledging the essential role of structural conditions, the crucial role of operationalising VR as a meaningful tool to ensure stakeholder engagement as a precondition for the successful adoption of VR in mental health care in current VR adoption literature, and despite several scholars studied the role of institutional logics when adopting new programmes, technologies, and clinical protocols in other domains, few, if any, have bridged these approaches and questions and studied the vital role that institutional logics may play in stakeholder meaning-making processes when adopting VR in mental health care to guide future adoption efforts.

### Theoretical framework

This paper draws upon the analytical concept of *institutional logics* to approach the meaning-making process between stakeholders in the adoption process of VR in mental health care.<sup>19,20</sup> According to Thornton and Ocasio,<sup>19</sup> institutional logics are socially constructed

pattern of cultural symbols and material practices. These patterns are embedded in specific assumptions and values that guide how meaning or sense is applied to everyday activities and how individuals and organisations reproduce lives and experiences.<sup>20</sup> For individuals and organisations, institutional logics are foundational symbolic schemas that provide sense and order to social reality and thus define the boundaries of appropriate institutional practices.<sup>16,18,21</sup> In innovation, institutional logics thus provides actors with a specific understanding of the appropriate form and function of innovations, e.g., VR technologies. Using institutional logics as a theoretical framework to study the adoption process of VR involves studying the specific symbolic meanings ascribed to the form and use of VR in everyday practices.

### Purpose

The purpose of this study is to explore the role of institutional logics in the stakeholders' understandings of the adoption process of VR technology in Danish mental health care to guide the future development and adoption of VR interventions.

### Methods

To explore the multiple stakeholders' personal experiences and perspectives, we applied a qualitative anthropological approach with a social constructivist perspective. This approach understands and approaches knowledge as produced by negotiations within specific contexts. It is, therefore, well-suited to explore a socially negotiated phenomenon and how it becomes grounded, such as when studying the role of institutional logics in adoption processes.<sup>22</sup> The study design was based on participant observations and qualitative interviews. The research was conducted by a multidisciplinary team consisting of two anthropologists (male PhD and female PhD), a sociologist (female PhD), and two political scientists (female PhD and female MA).

### Study setting

A recent mapping of VR in public health care systems identified 55 health initiatives using VR as part of their intervention in Denmark,<sup>23</sup> of which seven were initiated at regional mental health hospitals. At the hospital where this study was carried out, adopting new technologies in mental health care involves two main organisational stakeholders. On the political-administrative level, a healthcare development and innovation section is responsible for identifying new healthcare innovations for clinical practice and introducing them to potential stakeholders at regional hospitals. On the psychiatric hospital level, a department of information technology (IT) is equally responsible for identifying and implementing innovations at the local hospitals,

together with FS and management representatives. However, it has furthermore the task of ensuring that innovations are compatible with existing IT solutions and providing support to FS in their everyday use of innovations. Both departments may provide funding for local innovation initiatives. The Department of Innovation and the Department of IT meet regularly to coordinate their innovation initiatives.

The present study follows the adoption process in two different VR initiatives at the Psychiatric Hospital. Project A was initiated bottom-up by an interdisciplinary group of healthcare professionals to use VR technology for training new clinical staff. Project B was initiated top-down, with the hospital administration deciding to support the implementation of VR solutions. In Project B, interdisciplinary healthcare professionals were invited to develop and implement the VR solution in psychiatric care.

### Data collection

We derived data from two focus group interviews and 11 individual interviews and conducted participant observations in four meetings between stakeholders concerning the adoption of VR technology (See Table 1).

We used purposive sampling when recruiting participants for interviews.<sup>24</sup>

Participants were identified to attain a multilevel representation of both FS and ASS tasked with implementing VR technology in practice. Our approach contributed to a broad representation and in-depth insights into the adoption process.<sup>24</sup> When invited, the participants were informed about the research purpose and information about the researchers. Participants were approached either

by email, telephone, or face-to-face. All participants approached agreed to participate in the study. The participants and researchers did not know each other prior to study commencement, and recruitment continued until sufficient data material for a robust analysis was estimated by the researchers to have been met.

Due to the coronavirus disease 2019 (COVID-19) pandemic, focus groups, individual interviews, and most participant observations took place via online video conference. Interviews were semi-structured and followed an interview guide informed by existing literature and insights from observations and dialogues. In the interview guide, the participants were asked to reflect on questions concerning their understanding of the technology, its purpose and future application, their experience with the implementation process, and the challenges and opportunities they accounted for in this process. To elicit the participants' experiences with and perceptions of VR, we used open questions such as: *How do you see the future of VR? How do you perceive VR as a tool in mental health care? Could you tell me about your personal experiences working with VR? Have you encountered specific challenges/benefits in working with VR, and if so, what were they?* The same guide was used for all interviews, but the extent of probing to different topics varied between the participants.

Interviews lasted between 50 min and 1 h and 39 min. Interviews were recorded and transcribed verbatim. Overall we collected data for ten months (from May 2021 to February 2022). MDT, SB, and SL undertook participation observations, while SB and MDT conducted interviews. All researchers involved are social scientists with a substantial experience in qualitative data collection and analysis.

### Data-Analysis

We analysed data using Braun and Clarke's<sup>25,26</sup> thematic analysis. The method includes several data readings while gradually developing and validating the analysis. MDT and SB performed the data analysis supported by discussions with the remaining research team. Initially, we read the interviews several times to familiarise ourselves with the data. During this reading, we recorded initial ideas for further exploration. MDT and SB developed codes and conducted a test coding of an interview. Based on the test coding, MDT and SB compared their understandings of the codes and discussed differences to align and ensure a common understanding when coding the material. MDT and SB then systematically coded interesting features across the data set in NVivoTM,<sup>27</sup> and data relevant to each initial code were carefully collected. We then arranged our data in meaningful groups and started identifying themes. During this step, we found a strong resonance between the codes and a potential theoretical

**Table 1.** Data material.

Individual interviews	Four healthcare professionals (Working in clinical practice, as researchers, or in both fields)
	Two heads of departments (clinical and administrative)
	Three innovation consultants
	Two IT consultants
Focus group interviews	Three healthcare professionals
	Four innovation consultants
Participant observations	Four meetings between stakeholders concerning the adoption of VR technology

IT: information technology; VR: virtual reality.

framework<sup>28,29</sup> based on the concept of *institutional logics*.<sup>19,20</sup> We, therefore, re-coded the material, sorted the codes into new potential themes, and combined the relevant coded extracts into the identified themes. As our next step, we reviewed our themes and refined them accordingly. Some themes were discarded, some were kept as is, and others collapsed into a single theme. We then worked on defining and naming the themes identified. We named and defined two main themes: (a) Diffusion logic and (b) professional logic. Each theme contained several sub-themes. Our final step was to select coded quotations that displayed the essence of the themes and sub-themes.<sup>25</sup> To enhance our analysis, we used different triangulation modes during this phase. When identifying themes and results, we used researcher-triangulation consisting of multiple discussions between researchers in the research group. Moreover, we presented a preliminary interpretation of our results to a group of participants from the study to ensure that our results resonated with our participant's understandings.

### Ethics

The project followed the American Anthropological Association's guidelines for qualitative research ([www.ethics.americananthro.org](http://www.ethics.americananthro.org)). We obtained informed recorded consent before every video or telephone interview. By using recorded consent, we adhered to the guidelines for informed consent formulated by the Danish Data Protection Agency, stating that consent can be oral, written, or digital as long as the researcher may prove that consent was given. Following a similar storage practice as in the case of written consent, we stored the consent recordings in secure folders. Participants were here instructed that they could always withdraw their consent. We anonymised the results by removing names and other identifiable details. In Denmark, studies that do not include human biological material and are based on questionnaires and interviews do not require permission from the Ethical Committee, according to the Promulgation of the Law on Ethical Management of Health Science Research Projects.

### Results

All informants agreed that VR was a technology with great potential in mental health care. VR's current technological maturity and affordability were seen as having been achieved in a few years, and it was expected that the technology and price would only improve. All informants expected VR to be a significant part of the future mental health care system.

Nevertheless, while all agreed on the potentialities of VR, the analysis showed how the ASS and FS framed their expectations and understandings within two very different logics. We have identified these logics empirically

**Table 2.** Institutional logics.

	Focal point	Causal pathway	Adoption process
Diffusion logic	The organisation as a whole	Technology as the point of departure	Upscaling process
Professional logic	Specific patient groups or healthcare professionals	Clinical problem as the point of departure	Scientific process

as *Diffusion logic* and *Professional logic*. These logics varied in terms of focal points and understandings of how the adoption process of VR technology should proceed. Table 2 displays these two empirically derived logics. The analysis showed that all informants drew on both logics in their framings of VR. However, they did so with different emphases, often making one logic more dominant than the other.

### Diffusion logic

The analysis identified a logic of diffusion, that underpinned specific understandings of VR technology as a generic instrument able to meet the needs of a universal end-user; in this case, the healthcare organisation as a whole. Within this logic, successful adoption of VR technology entailed the ideal of expanding VR technology to the whole organisation. Higher uptake of VR technology in general was thus a central measure of success.

*The organisation as a whole.* When describing VR technology's use and potential for mental health care, both FS and ASS described the overall goal as providing VR solutions that were amenable to the needs of patients in the mental health care sector as a whole. This *whole* mental health care sector was often presented under various terms such as *the organisation*, *the health care system*, and *psychiatry*. Though all informants occasionally mentioned the importance of catering to the individual needs of specific patient groups, the overall goal in this logic of diffusion was to serve broader patient group needs. As an example, one ASS said:

It makes little sense to develop a solution for a specific department. Then a different department also has to develop the same solution. So, in that way, we have a fundamental view always to consider whether there is an opportunity to test this in some ways so that more people can benefit from what is being made. (ASS interview)

Some ASS here framed their role in developing and adopting VR for the sake of the organisation in terms of following a specific causal pathway. This causal pathway entailed taking the technology and its possibility for upscaling it as a point of departure. The aim was to promote VR technology and to quickly advance its use in the organisation as a whole:

We have taken this approach to new technologies, where we come up with them and then say, how can we use them and get them into our healthcare sector? What happens when we do that? Instead of us just sitting and waiting for someone to think that VR could be a solution. (ASS interview)

Rather than departing from the needs and challenges of a specific patient group, these ASS described the adoption process for technology in health care as one of taking a technology (i.e., VR) and finding a suitable case in the health care system with problems in which VR could be the answer, and test it accordingly. If it succeeded and showed positive outcomes, their next step would be to focus on upscaling it. If it turned out that VR could not yield the necessary positive outcomes in the chosen venue, they would move on and test VR in a different venue and so forth. If it kept on failing to produce positive outcomes, they would consider shelving it.

*Upscaling process.* Ideas of *upscaling* (sometimes also framed as *spreading VR* or making *VR implementable*) were seen as a critical component of the VR development and adoption process to best meet the organisation's needs. As one ASS emphasised:

Because it's one of the things we have an enormous amount of focus on, that's what it's all about. It's nice enough to try something in a limited place. Still, we must constantly be able to spread it out in our colossal organisation across the Region. (ASS interview)

According to these informants, the development and testing of VR in one case setting, therefore, could (and should) be done in ways that would benefit both the needs of that particular clinical setting and other clinical settings (i.e., health care more generally). Several ASS members inferred that only by focusing on upscaling throughout the organisation could it be ensured that the development and adoption of the technology would be done in ways that promoted organisational learning. Such efforts would allow favourable results and experiences to be aggregated in each case and afterwards spread and replicated in other settings accordingly to benefit the organisation as a whole. In this way, the focal point of the organisation as a whole and the demand for upscaling

were highly entangled. One of the ASS explained it as follows:

It is about organisational learning. The way we get it out there. That is to say, there is a place that does a project, then you do a trial operation, and then you have to spread it out so that it is used everywhere. And that is – that must be the goal. (ASS interview)

Among the ASS who followed this logic, generic VR solutions were framed as a way to avoid fragmentation and ensure the possibility of widespread use across the organisation. Individual healthcare professional staff and 'activists' were viewed as instrumental and vital in developing and adopting new technologies, including VR. However, simultaneously these 'activists' were considered a potential barrier to the overall organisational adoption process by focusing *too much* on their specific clinical context and thereby not seeing the bigger organisational picture.

*Transferability, generic solutions, and organisational sustainability.* To support upscaling and prevent fragmentation, several informants emphasised the need to develop and adopt transferable VR solutions. With this (explicit or implicit) aim of transferability came an understanding of the necessity of creating a generic VR platform for mental health care. This platform was understood as both capable of being tailored to meet local clinical needs while simultaneously being adaptive in terms of content so that it could easily be altered and used across multiple departments and patient groups.

Something that has been developed somewhere, you then have to use it the whole department. That is the first step. And then you have to get it out into all eight departments. That's the next step. But these steps demand a lot. In other words, implementation requires more than development so that it is implemented appropriately in the way it is intended. Because otherwise, it will be 117 different versions. (ASS interview)

Within the logic of diffusion, certain partnerships were seen as more appropriate than others. Thus, it was essential to seek out VR partnerships and products that the entire organisation could adopt by providing solutions scalable outside individual units. It also meant working to hinder the engagement in collaborations and solutions that fitted a specific context but did not have future implementation as its aim:

And then they have started, as it were, to either develop something themselves or perhaps they have found out via someone's cousin who knows someone who could help them with this. And then it is often entirely random who you partner with and what solutions you see. So it's

people like that – those good enthusiasts who have just tried it out and then found out that it can do something or other without really deciding what should happen when they are done trying it out and how it can be integrated or implemented. (ASS focus group interview)

When choosing a VR platform for adoption and partners for collaboration, selecting highly skilled providers that were also deemed financially resilient and could be expected to deliver support and upgrades for years was essential. As a result, ASS articulated that solutions based on smaller companies (often expressed as *one man in a basement*) were less desirable:

This thing about choosing him in the basement because he makes some good films, and then suddenly, he is not there anymore. (ASS focus group interview)

Several ASS members expressed that the development and adoption of VR for mental health care always needed to consider the economy. They articulated that the health-care system was *under pressure* from a lack of finances and how developing local VR solutions from scratch was considered an expensive ordeal:

So it's also the fact that it's an expensive technology when we have to make these recordings from scratch. At least, that's how far we've come. (ASS interview)

The logic of diffusion promoted an understanding of local VR developments as economically unsustainable if developed and adopted without focusing on the organisation as a whole. Vigilance in managing financial resources and the constant exertion of financial prudence meant pursuing a VR solution that would figure financially sustainable in the current system. It also included a focus on the importance of the establishment of central IT competencies.

### Professional logic

In parallel with the logic of diffusion, the analysis also identified a professional logic that was underpinned by an understanding of VR technology as a specific instrument to improve local clinical practices and help patients (either being used in concrete patient interventions or as a means of quality improvement via, e.g., education of professionals). Within the professional logic, the individual patient was the ultimate end-user, and the value of VR was measured by its ability to solve a specific clinical problem. Often represented by research 'activists', the professional logic was also embedded in a medical research tradition. As such, this logic involved particular demands for developing and adopting VR technology where effects could be documented following a systematic and thorough scientific approach.

*Particular end-users.* Among FS, VR technology was understood first and foremost as a tool that would afford new ways of helping *specific* patient groups or improving clinical practices through education in a particular setting. The objective of adopting VR technology in mental health care was to help explicitly defined end-user in ways that had not been possible before. The success and potential of the technology were thus linked to its capacity to demonstrate clinical value and improved outcomes. As one FS said during interviews when discussing her concrete clinical work:

But I hope in the long run that it is something where you can find exactly where it makes sense to use it. And that you use it wisely. That you can solve something with it (...) That you can solve some things where you can use it in the department, that is to help some unwell patients. (...) It's about us getting to use it as a treatment tool. And a training tool and a supplement for different things, but it won't be something that takes over everything. (FS interview)

For those who drew on professional logic, it meant that the employment of VR technology in practice became more confined to particular settings and specific patient/user groups. This professional logic thus emphasised a clear objective for the VR development process as a causal pathway departing ultimately in a concrete clinical problem:

That is why you must also address when you want to use VR, how, which patients, and what you hope to achieve. If it is the treatment of the patient, you need to know how the patient reacts so that you might get a better insight into what you can use this tool for specifically. (ASS interview)

In describing the future application of VR technology, those who drew upon a professional logic were constantly mindful of the fit with clinical practice and which specific patient or clinical groups would benefit from using VR technology. For example, they described VR technology as helping patients suffering from PTSD, anxiety, and eating disorders. Still, within this logic, VR was not framed around ideas of upscaling potential. Instead, it was described as a tool specific to their patients and, therefore, a particular tool that was irrelevant to other patient groups or conditions. As one of the FS stated telling of how they had been working with specific patient groups in order to minimise arousal:

It is the clinicians who present the problem and say, we think VR might be a solution to this clinical problem, and we need this kind of content (...) I may doubt whether VR is useful if you have significant cognitive difficulties.

I can also be unsure how VR should be used if you are psychotic in terms of the content you have to use. What we have been working with is specifically related to minimising arousal (for our patients). (FS interview)

It was therefore perceived as essential among FS members that to realise such benefits, special attention needed to be directed towards stringently developing or choosing VR solutions following the needs of particular end-users in mind (e.g., patients or clinical staff) when or if adopting VR. As seen in the quotation, this was based on ideas of how a development process of VR should ideally function.

A FS further added how, when working to develop and adopt effective VR solutions, the unique features of each group of end-users required constant vigilance and focus on detail to ensure that VR also responded appropriately to such features:

That's why it's so exciting, I think, to work so much into the details. Because of the smallest parts, if someone asks about the shortcomings, then you actually have to have had a pedagogical reflection on which choices have been made and which non-choices have been made. (FS interview)

Neglecting a strict focus on particularity and choosing a generic solution across end-user groups was, on the other hand, seen as putting technology ahead of the user or *dancing after the technology* (a Danish expression meaning to put technology at the centre of attention and letting technology decide pathways, logic, and actions) and, therefore, the wrong path to pursue.

*Particularity and the process of evidence-based practices.* The analysis showed that when informants drew upon professional logic, they focused on how the development and adoption process should ensure measurable and objective improvement for the strictly defined end-user groups. Thus, inherent to the logic was the fundamental understanding of scientific evidence as the foundation of treatment and education in the healthcare sector and, therefore, as a critical mechanism for the adoption process.

As seen in the prior section, FS stressed that a clinical problem should always be the departure point for introducing VR, not the other way around. VR technology, therefore, did not have an intrinsic value but instead was applicable so far as it proved an instrumental value for patients:

Because it is that which provides you with a sense of engagement, it is that which commits you to run it. It is that we want something for our patients. We want to help make a difference. This is what drives it for us, who are both researchers and clinicians. It's not because we have to be famous for developing VR. That's not what's important. So if you need to find the strength and motivation to put some energy into it, going forward in such a process, then

it must be driven by a clinical problem where you think this could perhaps do something different for my patients. It could help my patients in a new way. (FS interview)

In continuation of this understanding, following the traditional clinical scientific process was vital to ensure that the technology would benefit the patients and professionals learning to work with concrete patients. An FS elaborated this argument of clinical scientific testing and validation as a prerequisite for adoption by equating VR to other forms of treatment or interventions in mental health care, in which such scientific approaches were viewed as intrinsic to the adoption process.

And just like when we give drug treatment and all sorts of other treatments, there is a procedure where we assess the patient, and we assess, is this the right thing for them? And I don't think it's that much different here. (...) There, you are trained in what that pill contains and what the side effects are. And that's why it (VR) also requires research to ensure that you register the side effects when you do that research. (FS interview)

For the FS, the development, use, and adoption of VR technology in mental health thus petitioned a systematic process where evidence and research were seen as the crucial starting point. According to the adherents to this logic, the success of VR technology was thus dependent on not only its ability to be tailored and customised to clinical settings and, ultimately, its ability to solve a clinical problem but also its ability to demonstrate such success scientifically and, via rigorous scientific investigation, provide positive outcomes, i.e., scientific evidence as a gateway for further adoption efforts.

For healthcare professionals, this framing was intrinsic to the adoption process. It was not only mentioned as seen explicitly in interviews but also illustrated when the IT department, on their own, bought new VR equipment for all mental health departments from a vendor capable of providing a VR solution that could be expanded because of what was explained as its generic nature.

This approach meant the technology could function and be supported in multiple settings without being engineered for each patient group. Two FS commented on how this approach fundamentally turned the process on its head:

But that was what we were in the process of developing. A solution for our patient group [The other FS nods in confirmation and agrees vocally]. So yes, we were surprised, yes. They suddenly arrived with different VR goggles than the ones we had extensively worked with. It is all in reverse order here! I mean, implementation before research? It makes no sense? Now it is the goggle and then the patient. (Informal dialogue with two FS)

To the FS, choosing one generic VR solution to be tried in multiple fields was perceived as a fundamental breach of clinical research etiquette. Therefore, a critical breach in their understanding of the steps of a proper scientific adoption process aimed at benefitting the needs of particular user groups.

## Discussion

When implementing VR solutions in mental health care, we infer that institutional logics plays a vital role in the adoption process. In the present analysis, we have demonstrated how ASS and FS draw upon very different logics providing them with different focal points, causal pathways, and approaches to adopting VR. Such differences can cause friction that may hinder the adoption process if not accommodated adequately.

Frontline, administrative, and service staff in mental health care are crucial in adopting innovations and technologies.<sup>13</sup> Thus, understanding their perceptions of technologies such as VR and the perceived barriers and facilitators is instrumental in promoting a successful adoption.<sup>1</sup> Our analysis shows that applying an institutional logics perspective to these processes gives novel insights into the foundational symbolic orders that these actors draw upon when determining the sense and appropriateness of VR. Ascribing meaning to technology (i.e., meaning-making) is well-established as a necessary component of adopting new technologies in health care.<sup>13,14</sup> Conversely, failure to ascribe acceptable common meanings may result in organisations abandoning technologies accordingly.<sup>13</sup> We add to these insights by unpacking the meaning-making processes of ASS and FS when implementing VR using the theoretical notion of Institutional logics. By doing so, we argue that knowledge is gained about how foundational symbolic orders shape these meaning-making processes. Following existing research from related fields of study, this understanding, we emphasise, not only offers crucial insights into the origin of potential frictions that may hinder adoption (See, e.g.,<sup>16</sup>) but, in doing so, also opens up possibilities for managing them accordingly.

In the work of Davidoff et al.<sup>30</sup> classic definition of evidence-based medicine, particular clinical problems determine what evidence needs to be sought, methods that elicit and explain causal relations are seen as the golden standard, and constant critical evaluation of designs and results is seen as crucial to determine if outcomes are valid and specific practices should be adopted or not.<sup>30,31</sup> Our study echoes these insights and illustrates how such stringent foundations for good evidence-based practices remained the foundational component of the *professional logic* deployed by the FS. Moreover, we revealed that by following professional logic, the FS understood VR's success as dependent on being developed and adapted to fit the diagnostic-specific needs of patients and

critically evaluated accordingly to ensure evidence as a necessary condition for adoption. Our findings here resonate with studies by Chung et al.,<sup>1</sup> Bell et al.,<sup>11</sup> and Alzahrani,<sup>32</sup> who argue that first proving efficacy via evidence-based research is considered crucial for clinical staff when considering the adoption of VR for use in their practices.

Institutional logics are, however, seldom singular in organisational settings such as health care.<sup>16,18,33–35</sup> In complex organisations, multiple stakeholders may equally result in multiple institutional logics co-existing, each producing unique understandings of practices and tools.<sup>18,36</sup> When implementing a VR solution into a complex organisation such as that of a mental health hospital setting, finding the existence of multiple logics in play should therefore come as less of a surprise. However, notably in the field of implementation, we showed how the presence of another institutional logic offered dramatically different focal points, causal pathways, and adoption processes in turn. In our study, ASS drew upon what we have defined empirically as *diffusion logic*. The diffusion logic resonates strongly with the field of innovation. According to Torfing,<sup>37</sup> innovation, though not to be considered an a priori good, involves the disruption of existing habitual knowledge and practices actively promoting new ways of thinking and doing (see also the work of Osborne and Brown<sup>38</sup>). Our study showed that diffusion logic did not consider evidence a necessary prerequisite for action. On the contrary, following this logic, action and testing of new practices and technology could come first without prior knowledge of the result. Through trial and error, innovations could prove their value, and thus the need for evidence and scientific rigour played a secondary role. Following the *diffusion logic*, we demonstrated how the form and function of VR to the ASS were embedded in scalability ideas to benefit the organisation by providing organisational learning and ensuring sustainability and support could be provided and reasonably financially afforded accordingly. Regarding adopting VR, the literature agrees that understanding and accommodating organisational factors are crucial to the adoption process.<sup>11,39</sup> The attention afforded by the diffusion logic to the ASS thus resonates with recent studies arguing that to facilitate the adoption of VR in clinical practice, organisational environmental issues of funding, competency building, and support need to be acknowledged and accommodated.<sup>1,40</sup> However, despite being presented with different logics, each representing the possibility of accommodating the needs of vital actors in mental health care, we argue that all is not well if such differences are not also accommodated because, as we demonstrate, they may come to influence the technological adoption processes in negative ways.

According to Akmal et al.,<sup>16</sup> multiple institutional logics may give rise to institutional frictions when different meanings collide, and practices and objects become the subject of



contestation. Our study of VR builds upon this and argues that investigating the different institutional logics that actors draw upon in the development phase allows us to see and understand where and why friction between actors, such as the ASS and FS in our study, may arise when adopting VR, in a situation where both FS and ASS otherwise agree on the potentiality of VR solutions in mental health care. This knowledge may be particularly crucial to cases where soft technologies such as VR are adopted into health-care. As opposed to the adoption of new surgical equipment or pharmaceuticals, adopting VR and other leisure technologies is still surrounded by looser regulation and less strict demands for clinical trials and documentation (features resonating with the *professional logic*). Under such conditions, innovation departments often act as drivers by exploring technology markets and their products to bring them into mental health care and ensure broader application. To the adoption of VR in diverse mental health care settings, these specific conditions may, therefore, exacerbate the existence and influence of multiple institutional logics, including *diffusion logic* in the adoption process.

Though focusing specifically on mental health, our results may also add to discussions on implementing VR in the health care sector more broadly. Our identification of stakeholder frictions resonates with existing studies of barriers and facilitators when adopting VR in other health care settings.<sup>41</sup> According to Kouijzer et al.,<sup>41</sup> it is crucial to accommodate the needs of all stakeholders (including both FS and ASS) in the adoption process. We agree and add to these recommendations that such accommodation of needs may be advanced by integrating an institutional logics perspective to facilitate VR adoption in health care and avoid stakeholder frictions. Technologies are inherently flexible, and their interpretations are always the products of ongoing negotiations.<sup>42,43</sup> This means that frictions between multiple institutional logics concerning the adoption of VR may be countered and remedied to the benefit of adoption. Different institutional logics may fruitfully co-exist, according to Reay and Hinings<sup>33</sup> (See also the work of Beech and Huxham<sup>44</sup>). Such co-existence, however, demands that collaboration between stakeholders is promoted in ways that both support the uniqueness and independence of co-existing institutional logics and the accomplishment of mutual goals.<sup>33</sup> Building upon the insights by Reay and Hinings,<sup>33</sup> we argue that crucial steps towards managing the different meanings that may hinder the adoption of VR in various health care settings, therefore, as a first step involves acknowledging the existence of multiple institutional logics and what sets them apart. However, more than a simple acknowledgment of differences is needed. As recommended by Kouijzer et al.,<sup>41</sup> it is also essential to involve key stakeholders throughout the entire development and adoption phase to ensure its success. We agree, and based on our study, we add that this also involves calling organisations wanting

to adopt VR in various health care setting to actively provide collaborative venues for participating stakeholders in which their differences are made the subject of joint reflection. Such collaborative platforms or meetings based on an institutional logics perspective may ensure that potential frictions between stakeholders concerning VR are brought out in the open and given time for debate, allowing them time to agree on an acceptable final interpretation to guide a shared adoption process accordingly.

### Strengths and limitations

There are some limitations to our study. The institutional logics in our study represents the logics drawn upon by two arrangements of stakeholders, FS and ASS, respectively. However, we acknowledge that these two may not necessarily be the only stakeholders involved when adopting VR in mental health care. Though not addressed in this paper, stakeholders such as VR suppliers and developers may have influenced the adoption process and the institutional logics presented in the analysis. In our analysis, we have focused on how human stakeholders negotiate the meaning of VR grounded in specific institutional logic in the adoption process. However, we acknowledge that technologies such as VR also constitute material actors that may actively and productively contribute to healthcare meaning-making processes.<sup>43,45</sup> To provide clarity and focus for the analysis, we have, however, omitted analysing this element. This paper has not included the direct role of patients in the adoption process other than partially through the perspectives of the included stakeholders. We recognise the importance that patients may also play as stakeholders in the adoption process and acknowledge their lack of direct representation as a limitation to our paper. We highly encourage future papers to study the adoption process from the patient's perspective.

This study was conducted during the COVID-19 pandemic. The pandemic meant that the participants in our research and the VR initiatives they were involved in adopting experienced several incidents of COVID-19 shutdown, causing several periods of stand-by where they could not work on their projects. Moreover, following the COVID-19 pandemic, much focus on mental health care in Denmark in 2020–2022 was directed toward preventing the spread of the disease. These conditions meant that many initiatives not directly related to COVID-19, to an extent, may have received lesser attention from FS and ASS. We acknowledge that these conditions could have influenced the results of our study.

### Conclusion

This study explored the role of institutional logics in the adoption process of VR technology in Danish Mental health care. We studied how an innovation such as VR

was perceived and operationalised by stakeholders in this adoption process and how institutional logic guided the adoption process. Based on interviews and observations with frontline-, administrative-, and service staff, we demonstrated the crucial role institutional logics play in determining the meaning and use of VR in an adoption process. Our study revealed that even in cases where stakeholders fundamentally agree on the potentials of technology, different institutional logics may collide, causing friction and challenges. When guiding the future adoption of technologies in mental health care, it is essential to acknowledge and explicate the institutional logics drawn upon by stakeholders when adopting VR and provide arenas for stakeholders to reach a shared and accepted understanding. To the researchers, this calls for more future studies to identify or, if lacking, develop the needed evidence-based participatory adoption designs to advance such collaborative efforts. Moreover, it is essential that such research studies also acknowledge, study, and integrate patients as crucial stakeholders.

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