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Acceptability and feasibility of virtual reality to promote health literacy in primary care from the health professional's view: A qualitative study

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ABSTRACT

Objective: The development of health literacy is important in the management of chronic pain and virtual reality may be an effective medium for its development. This study aims to understand the usability and acceptability of a virtual reality-based pain education system for the facilitation of health literacy.
Methods: Semi-structured interviews were conducted with health professionals who had used a VR-based pain education system within their clinical practice, to explore perceptions of feasibility. Data collection and analyses were informed by the Unified Theory of Acceptance and Use of Technology and the Integrated Model of Health Literacy.
Results: From 10 participants, the VR-based system was considered feasible in providing immersive experiential learning which addressed patient understanding and health-related communication.
Conclusion: VR appears to be perceived as an acceptable and feasible technology to support the development of health literacy in people with chronic pain. Its largest perceived benefit was its capacity to provide an immersive and entertaining alternative to conventional methods of pain education.
Practice implications: Virtual reality is considered as a feasible method of facilitating patient understanding and health-related communication related to chronic pain. Feasibility of such a tool relies clinically on time available, social expectations of VR, and the role of immersive and experiential learning within the management of chronic pain.

1. Introduction

Chronic pain, defined as pain that persists or reoccurs for more than three months [1], affects approximately 30–50% of the UK population [2]. The quality-of-life for individuals suffering from chronic pain is significantly reduced [3]. Education that helps patients learn and develop health related competencies is recommended by The National Institute for Health and Care Excellence (NICE) as part of good clinical practice [4] and should be delivered with the intention of developing patient health literacy [5]. Health literacy can be defined as "literacy which entails peoples knowledge, motivation and competences to access, understand, appraise and apply health information in order to make judgements and make decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life" [6]. Limited health literacy has negative effects on several aspects of an individual's ability to self-manage such as low treatment adherence, ineffective patient-provider communication, and insufficient health knowledge [7] thus addressing health literacy should be seen as an important objective of care [8]. Providing individuals with interventions which address one's ability to understand information related to chronic pain may prove beneficial however, low levels of health literacy can negatively impact understanding and appraisal of education related to chronic pain [9]. Reducing the complexity of such education for those with chronic pain is a perceived priority [9] therefore utilising approaches which provide visual aids may enhance the provision of such education [10]. Recent technological advancements, such as Virtual Reality (VR), have appeared to increase patient engagement [11], patient knowledge and treatment satisfaction [12]. VR is a device which provides a computer-simulated experience in which the user feels immersed and aims to provide a sense of presence within a virtual environment [13]. Previous literature has reported details of its use in areas such as student [14] and patient education [15]. There is potential for VR to act as an effective tool to facilitate in depth learning of educational materials in the healthcare setting however,

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questions remain around its adoption within healthcare [16]. VR applications are well tolerated by patients and are considered feasible and acceptable for those receiving palliative care [17] alongside treatments for agoraphobia [18], schizophrenia [19] and routine care for burns patients [20]. However, these VR applications were not delivered in the context to develop health literacy.

As new technologies could have the potential to play a significant role in delivering effective education to patients and given the potential limitations to the implementation of VR (cost. etc.), assessment of acceptability in this context is crucial in determining its potential clinical utility [21]. Examining the feasibility of VR as an educational tool, from key stakeholders such as healthcare professionals, provides insight into its utility as a management tool for patients with chronic pain. Therefore, the objectives of this study were to explore healthcare professional opinions of a virtual reality-based pain education system with regards to technology acceptability and suitability to address health literacy in patients with chronic pain.

2. Methods

2.1. Overview

Qualitative semi-structured interviews based on the Unified Theory of Acceptance and Use of Technology (UTAUT-2) [22] and the Integrated Model of Health Literacy (IMHL) [6] were conducted to explore the opinions of healthcare professionals of a VR-based pain education system.

2.2. User acceptability and usage

The Unified Theory of Acceptance and Use of Technology (UTAUT) [23], used to assess intentions to use technology, was expanded in 2012 to include additional constructs addressing hedonic motivation, price, value, and habit. This model not only explores the performance expectancy, effort expectancy, social influence and facilitating conditions for the adoption of technology but extends this into the consumer context. The effectiveness of VR-based technologies within healthcare may rely significantly on elements addressed within the hedonic, value and habitual elements of its use therefore, exploration of acceptability using the UTAUT-2 is applicable in this case. Data related to the acceptability and usage of the intervention were mapped against the constructs and definitions, found in Table A1.

2.3. Health literacy

The domains of health literacy were mapped using the Integrated Model of Health Literacy [6] (Fig. 1). At its core, this model refers to the competencies related to accessing, understanding, appraising, and applying health-related information within healthcare, disease prevention and health promotion. Table A2 shows the dimensions of health literacy within the context of these health domains. Questions aimed at determining the perceived suitability of the intervention to develop health literacy-related competencies were the following: "How do you think this tool effects your patient's ability to (1) access; (2) understand: (3) appraise and (4) apply information relevant to their health?" Responses were further explored by asking follow-up questions aimed at providing participants further opportunity to explore their thoughts and experiences.

2.4. VR-based pain education system

The Reality Health Pain Education Platform delivered via VR was developed to provide users with an immersive educational environment including sensory altering experiences and incorporates evidence-based concepts of pain science education (PSE), movement, diaphragmatic breathing, mindfulness, and graded exposure therapy. It combines audio-visual features which aims to provide the user with interactive PSE (Fig. 2) based upon the biopsychosocial model of pain. Modules contained within the experience include:

- Introduction: initial immersive environment providing user acclimatisation to VR environment, introduction to virtual avatar (Prof. Lorimer Moseley) and breathing exercises.
- Understanding pain: immersive and interactive experience of PSE from a biopsychosocial perspective including concepts about pain that patients have previously identified as valuable to them [24].
- Retrain your body: application of modern pain science to commence retraining of the pain system via interactive analogies and visualisations linked to movement and neuroplasticity.

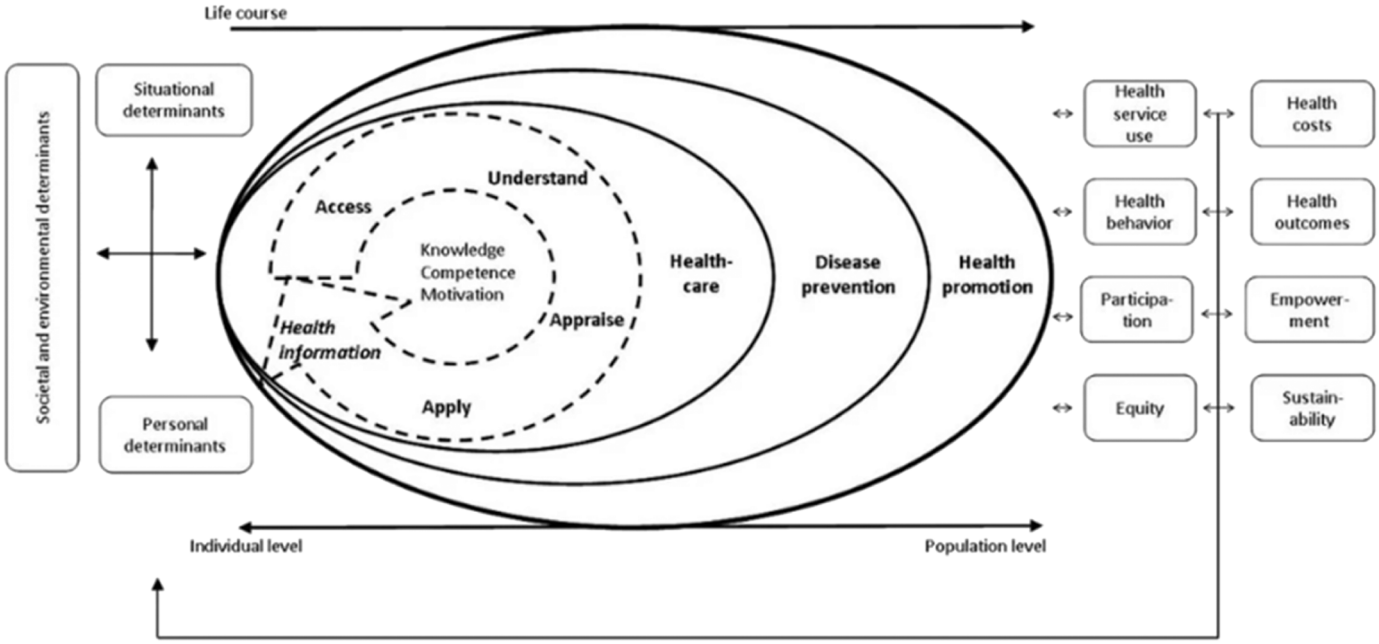

Fig. A 1. Integrated model of health literacy.

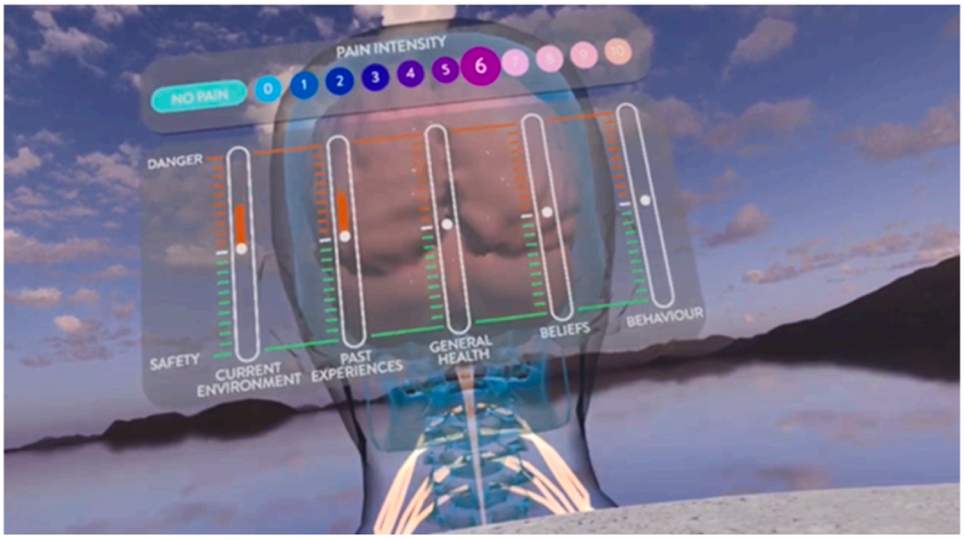

Fig. A 2. Reality Health Pain Education Platform.

- Retrain the brain: understanding the concept of 'pain amplification' and exploration of how one's current environment, past experiences, general health, beliefs, and behaviours can influence pain system hypersensitivity.
- Rehabilitation: designed to encourage light movements in a non-threatening environment, activities provide immersive graded exposure therapies whilst altering sensory input.

2.5. Procedure and participants

Ethical clearance for this research was obtained in December 2022. The recruitment of participants began in February 2023 and concluded in July 2023. Healthcare professionals were recruited from primary care settings based in Australia in locations where they were provided access to the intervention for use in clinical practice. Clinicians were contacted with an invitation to participate in the study via email and those who met the eligibility criteria (Table A3) were then invited to participate in an online video interview. Interviews were one-to-one (online via TEAMS) and consent was provided by participants completing a form electronically before the interview. Semi-structured questions were developed with the aims of eliciting responses relevant to the concepts of the research and can be found in Supplementary A1.

2.6. Data analysis

Data analysis followed steps from Braun and Clarke [25] whereby deductive thematic analysis was used to code and interpret the qualitative data. This 'top-down' approach enables concepts and themes drawn from the data to be related to scientific frameworks already developed within the field, increasing its relevance to the aims of the research. This research included the following six phases: (1) familiarisation with the data, (2) generation of initial codes, (3) searching for themes, (4) review of themes, (5) definition and naming of themes and finally (6) production of the report. The IMHL and UTAUT-2 were used as a coding framework to identify elements related to the acceptability and use of the technology alongside dimensions of health literacy. Components of each framework informed the formal coding scheme and are listed as headings in Table A1 & A2. The methods from this study aimed to achieve information power which refers to focusing on conducting in-depth interviews within a homogeneous group of experts within a dedicated field [26]. Adequate sample size was therefore determined by a combination of an iterative assessment of sample specificity, theoretical background, quality of dialogue and fruitfulness of the analysis regarding the study aims, and an a-priori approximation of adequate sample size informed by previous research [27].

3. Results

3.1. Overview

Several themes were apparent within the data collected from 10 participants (female = 6) consisting of physiotherapists (n = 5), rehabilitation consultants (n = 3), a nurse (n = 1) and an exercise physiologist (n = 1) who's length of qualification (years) of the healthcare professionals ranged from 3 to 30 (mean(sd) = 11.6 (±7.92)). Codes and themes for technology acceptance (18 codes from 598 quotes) (Fig. 3) and health literacy (121 quotes) (Table A4) are displayed below. By 10 interviews, we agreed that the discovery of salient new information had diminished significantly and therefore settled on this an adequately sized sample to achieve the research aims.

3.2. Technology acceptance and use

3.2.1. Performance expectancy

248 (41.5%) of identified quotes related to acceptability were associated with the performance of the device, making this the most prominent discussion point. Clinicians believed that the expected performance of the system was associated with several factors such as the relevance of the content to the patient, providing additional health-specific narratives to conceptualize the content and consideration of potential contraindications to its use. It was suggested that the main driver for performance with this system lies in its ability to provide health information within an immersive experience:

> PT08: "You are doing things you can't do in a normal treatment session. You can't bring up a fire, you can't bring up a cliff. Rather than explaining analogies (related to PSE), you are living in an analogy."

Despite this, negative perceptions from clinicians also reflected on the ability to provide the same information in conventional methods:

> PT05: "I definitely feel like I'm competent to, to deliver pain education, um, in a clinical setting without, you know, without this modality."

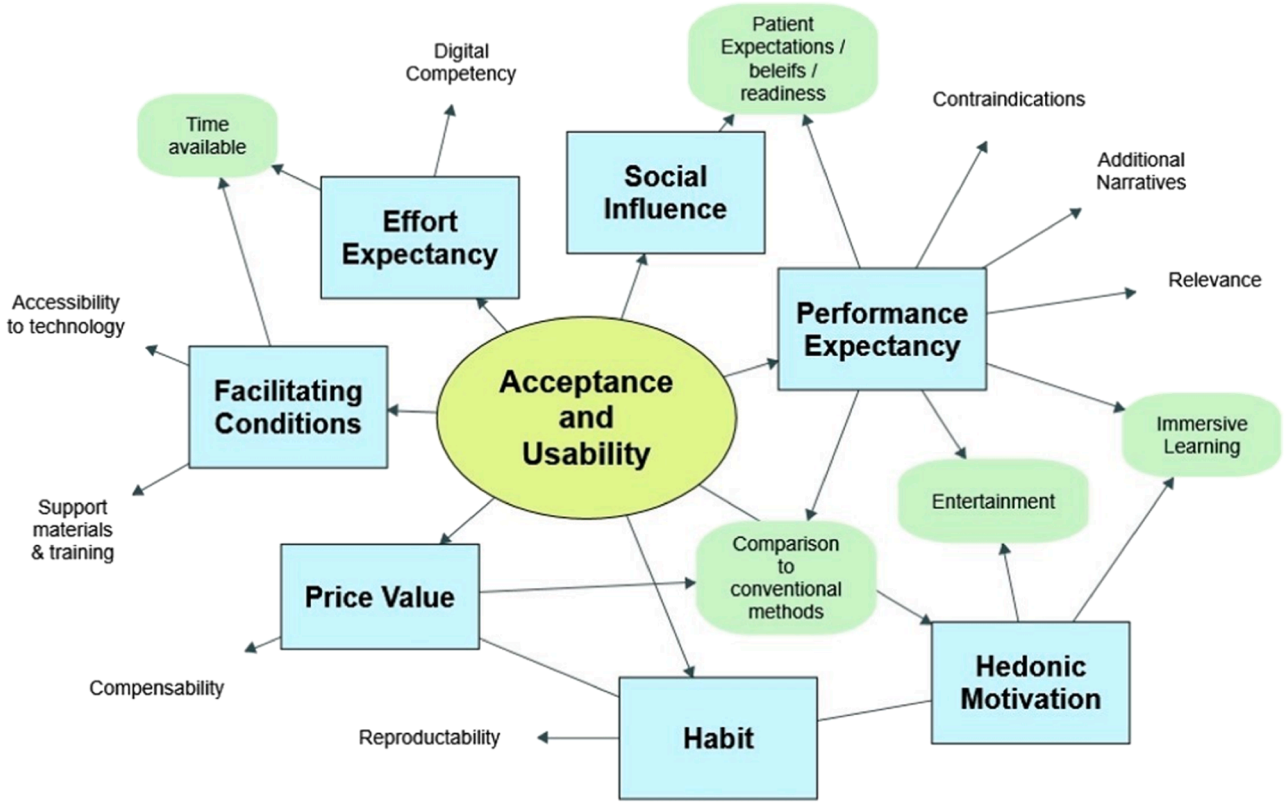

Fig. A3. Thematic Map.

3.2.2. Effort expectancy

The effort required to use the VR was considered as feasible and that the ability to successfully operate the technology may be rooted in the technological competency of the individual. 42 quotes (7%) related to technology acceptance were categorised related to effort expectancy. Troubleshooting issues which arise during the device set-up and use were challenges related to its use but were believed to be manageable with regular use:

> PT07: "Yeah. I think in my experience personally with acknowledging there's always some slight hiccups with technology along the way. Pretty easy, accessible for a lot of different clients, which is good."

Age of the user was not perceived as a potential influencing factor to its use. All participants considered the system easy to use in general, despite differences in age and perceived technological competency.

3.2.3. Social influence

Patient expectations and perspectives of healthcare approaches were factors contributing to the social influence. Within the 70 categorized quotes (11.7%) related to acceptability, clinicians believed that the patient expectations of the healthcare they receive dictated the acceptability and usage of the device. Despite clinicians indicating that the information delivered via VR would not differ from conventional methods, VR as a delivery method itself may often be governed by social expectations. Comments towards the tool being unique and new were observed throughout all interviews. Clinicians believed that the tool is considered as 'novel' and this plays a positive role in whether they believe others should be using the tool:

> PT04: "What does Einstein say? Doing the same thing and expecting a different result is the definition of insanity. […] why would I make someone have to go through something they've gone through already, this has to be different. It's got to be novel, it's got to add value to their lives. How can I make it different to what they've experienced? And VR is the epitome of that."

3.2.4. Facilitating conditions

Being provided with support materials, training, accessibility to the hardware/software and clinical practice time all presented as challenges related to the use of the system, based on 127 quotes (21.2%). A significant pre-requisite to the use of the system was that clinicians were provided with sufficient time to use the device. This often included time for set-up, navigation and troubleshooting. It was also stated that additional narratives would be essential in contextualising the VR-content via discussion, thus increasing the time required. Participants also reported that specific training would be required for clinicians to be able to use the technology:

> PT03: "I think it can be very effective, but I think it's also, learning how to really use it and apply it. I can show it to somebody, but it would also be good for me to learn."

3.2.5. Hedonic motivation

51 quotes (8.5%) showed that the nature of entertainment proved a recurring theme throughout the data. All participants believed that the tool being 'fun' and 'engaging' was important in the successful delivery of the material:

> PT05: "I guess one of the tricky parts about delivering pain education is delivering it in a way that keeps clients or patients engaged, or a way that connects with them. […] what I've noticed mostly about this particular platform or mode of delivery is really that, it seems to connect with people quite well."

3.2.6. Price value

Clinicians deemed the technology of value based on compensability,

adaptability and was contextualised based on comparison to conventional methods. This was represented by 27 quotes (4.5%). Despite clinicians' surprise at the cost of hardware, a perceived challenge remains among clinicians whether this cost be feasibly compensated within current healthcare business models. This was profoundly apparent for clinicians who described that the information itself is not novel and is available in many other forms (e.g. websites, leaflets, videos) which are, in general, free to access:

PT01: "I can deliver this message and it doesn't cost anything more."

3.2.7. Habit

From 33 quotes (5.5%) related to acceptability, it was believed that to form a habit, the technology would have to be reproductible, easy to use, and the clinician would have developed a form of digital competency. Comments towards the ability of the clinicians to confidently provide PSE highlighted that VR was a suitable solution to providing consistent evidence-based messages with reduced effort:

PT05: "I'm definitely doing a lot more pain education now having the tool, because I feel a lot more, I don't think empowered is the right word, but I've got feel like I've got support."

3.3. Health literacy

3.3.1. Accessing and obtaining information

Ensuring the suitability of VR to address a patient's ability to access and obtain health related information is perceived to be reliant on multiple factors including timing of the intervention (within the patient's treatment journey) alongside how the technology influences the therapeutic alliance. 35 quotes (28.9%) of those related to health literacy were associated with accessing and obtaining information. Clinicians highlighted concerns about the accessibility of the headsets in healthcare and society and that possessing competencies relating to health-seeking are a prerequisite to accessing this intervention:

PT07: "By the time someone actually has to get in the headset, they've effectively had to do health seeking themselves. Right? They haven't just been able to [put] one on the street."

3.3.2. Understanding information

From 25 quotes, (20.7%), clinicians reported that the patient's ability to understand information was further enhanced by the immersive element of VR. Conventional approaches to addressing a patient's ability to understand information were rooted in providing multimodal forms of information including videos, audio, written materials, and discussions. It was believed that VR provided an additional sensory modality which facilitated experiential learning which was deemed as a key factor to influence patient understanding:

PT04: "So if I had someone that had low health literacy and I knew that I wasn't going to be able to deliver the traditional pain education content, then these people have to learn by doing. And learn by showing. And the more ways you can do that, the better […] and there's no better way to do that, in my opinion, than VR because it's super immersive."

Although considered the most influential attribute, some sensory experiences were occasionally deemed as 'overstimulating' resulting in a reduction of the ability of patients to understand the information:

PT01: "I think it's very powerful and I've heard it from a lot of people that say they take the headset off and say they're overwhelmed."

3.3.3. Processing and appraising information

Participants believed that the main driver of a patient's ability to appraise health related information was rooted in their ability to understand the information. This was concluded from 31 quotes (25.6%) of quotes related to health literacy. It was suggested that although immersive experiential learning appropriately addresses elements of perceived complexity (e.g. nociception, pain pathways), challenges relating to information resonance remained apparent:

PT01: "The pain science stuff, the response is mixed. I've had people that take their headset off and say yeah, that's really interesting, but that's not my pain."

3.3.4. Applying / using information

30 quotes (24.8%) were identified as being associated with the ability of a patient to apply and use information, which was believed to be influenced by the VR intervention. Clinicians reported that it was commonplace that initiating open discussions with patients was difficult and that using VR aided motivational curiosity, thus facilitating health-related discussions and communication:

PT05: "I think it's that experience of them getting to see something or feel something, do something that really opens up some, some conversation. […] I would say the beauty of the tool is more about changing their mindset."

4. Discussion and conclusion

4.1. Discussion

This study provides new insight into healthcare professionals' opinions of a virtual reality-based pain education system for the development of health literacy in patients with chronic pain. Results show that many clinicians believed that the device was an acceptable and feasible tool to provide immersive experiential learning of health literacy concepts which had proven a useful adjunct in clinical practice.

4.1.1. Acceptability of virtual reality

Although a generally acceptable and feasible tool, considerations for its implementation within clinical practice were influenced by several factors including entertainment value, time available, social expectations of VR, and the role of immersive and/or experiential learning within the management of chronic pain. The main perceived benefit was that of providing patients with immersive and experiential learning and was considered unique to this technology. Clinicians reported that facilitating patient understanding of pain via the immersive and experiential elements of the experience appeared superior to conventional methods, although clinical outcomes were not formally assessed. It was expressed that the understanding of abstract concepts related to pathophysiology of chronic pain, and that of a sensitised pain system, were enhanced due to the immersive and interactive nature of its delivery. This is similar to previous research showing enhanced learning of health concepts using virtual reality in similar populations such as clinical practitioners and students [14,28], however less known in patients with chronic pain. Conventional methods of PSE result in 'patchy' and partial reconceptualization [29]. Given these opinions of VR and its ability to elicit emotional responses and provide 'lived' examples of mechanisms related to a sensitised pain system, research exploring whether utilising VR as a method of PSE delivery influences the effectiveness of information understanding and/or clinical outcomes is of interest. Additionally, clinicians reported that the tool was fun and entertaining to use. Literature reports the importance of rehabilitation interventions being fun and its influence on program adherence [30], something which is reiterated by healthcare professionals within this study. Participants believed that it is important for a tool to be fun and that it provides value to the patient which supports adherence to pain management programmes. The largely positive opinions of this device to support health-related understanding via the provision of unique, immersive and entertaining experiences may lead to superior outcomes

compared to conventional methods of PSE therefore, further research to explore this is warranted.

For the tool to be acceptable and feasible in clinical practice, the social beliefs of this technology and also the time available within clinical practice were identified as considerations which require attention. Given the influence that patient beliefs have in the effectiveness of clinical treatments for chronic pain [31] it is important to assess this before considering its implementation. Additionally, ensuring that clinicians have sufficient time for the intervention to be set-up and allow time for troubleshooting (often associated with VR-based technologies [32]) is required. Although the benefits appeared to be multifactorial, several concerns of using this tool were apparent. One consideration is the ability to provide similar information via conventional means. Clinicians reported that despite the novelty of VR as a tool to deliver such information, it was not exclusive to the technology. Comments towards the price value, which includes initial costing of hardware and software licencing, highlighted that the information could be delivered using cheaper methods however, it was noted that VR provides a novel, systematic and scalable approach to pain education. Additionally, it was noted that the usage of this technology relies on a clinical assessment of patient suitability. Many contraindications to the use of the tool were reported including head/neck injuries, mental health presentations (e.g. PTSD, claustrophobia) and sensitivity to sensory stimuli. Although rare in occasion, it was suggested that this method of delivery would not be suitable for these populations. Finally, commonly attributed to its performance expectancy, the novelty of such a tool was noted. It was apparent that participants believed that some of its potential for clinical effectiveness may be routed in the novelty of the technology. Although proving an initial benefit, analysis of the longevity of this effect proves important in understanding the role of perceived 'novelty' in the acceptability of technologies within pain management.

4.1.2. Virtual reality for patient health literacy

Patient health literacy relies on the ability to access, understand, appraise, and apply health related information. Findings from this research indicate that healthcare professionals believed the VR-based tool addressed multiple elements of health literacy in varying ways. The main benefit was that it facilitated health related understanding and information application and use. Facilitating understanding of pain and a patient's condition is encouraged by clinical guidelines [4]. Clinicians believed that providing patients with immersive sensory experiences was useful in facilitating not only patient understanding, but also patient communication skills. Mechanisms by which VR influences patient understanding of health information and its effects on patient health literacy requires formal exploration however, results from this study indicate that VR may have the potential to provide superior outcomes to conventional delivery methods of health-related information. Lack of understanding has been reported as a barrier to effective communication within clinical practice [33]. Comments towards the facilitation of patient curiosity was also present within the data. It appears that increased patient understanding and curiosity, facilitated patient-provider communication. It was proposed that addressing patient health-related understanding using a novel and immersive technology caused an increase in curiosity within patients, which then facilitated health related communication. Given that a sufficient therapeutic alliance can facilitate recovery and improve pain outcomes [34,35], the mechanisms by which VR facilitates health-related communication, and the associated role of information understanding and curiosity, are of interest. The ability of VR to provide immersive sensory experiences may facilitate curiosity in patients and thus may prove a useful tool to assist clinicians in facilitating an initial therapeutic alliance, although further research exploring this is required.

4.1.3. Strengths and limitations

Several limitations should be considered when interpreting this information. This qualitative method is not designed for transferability of findings and thus any consideration of the relevance to populations or practices dissimilar to those within this research should be done with caution. Critically, there is a need to consider views of all stakeholders (e.g., carers, patients) from various disciplines who are involved with the care of patients with chronic pain when considering the acceptability of such technologies therefore, future research should consider these populations. Finally, this research was conducted in Australian healthcare practice thus may not be transferable to other health care settings, highlighting the importance of future research in other regions.

4.2. Conclusion

This paper provides new insights into the acceptability and feasibility of a VR-based pain education system for the development of health literacy in people living with chronic pain. The results of this study indicate that clinicians believe that such a tool can address elements of health literacy, notably information understanding, in an acceptable and feasible way. Additionally, consideration of several factors when implementing VR into clinical practice include time available, patient beliefs, and the role of entertaining immersive experiential learning for patients with chronic pain.

4.3. Practical implications

Virtual reality is considered as a feasible method of facilitating patient understanding and health-related communication related to the management of chronic pain. Feasibility of such a tool relies clinically on time available, social expectations of VR, and the role of immersive and experiential learning within the management of chronic pain. Such factors should be considered during its implementation within clinical practice for the development of health literacy in people with chronic pain.

Declaration of Competing Interest

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgement

None.

Appendix A

Table A1
Constructs of UTAUT-2 and IMHL.

Performance Expectancy	*The degree to which using a technology will provide benefits to consumers in performing certain activities.*
Effort Expectancy	*The degree of ease associated with consumer's use of technology.*
Social Influence	*The extent to which consumers perceive that important others (e.g.,family and friends) believe that one should use a particular technology.*
Facilitating Conditions	*Consumer's perceptions of the resources and support available to perform such behaviour.*
Hedonic Motivation	*The fun or pleasure derived from using a technology.*
Price Value	*The benefits of using such technology in comparison to the monetary cost and price value of that technology.*
Habit	*The extent to which people tend to perform behaviours automatically because of learning.*

Table A2
Dimensions of health literacy within the context of health domains.

Access/obtain information relevant to health	Understand information relevant to health	Process/appraise information relevant to health	Apply/use information relevant to health
Ability to access information on medical or clinical issues, risk factors and/or determinants of health within the social and physical environment.	Ability to understand medical information, information on risk factors and/or information on determinants of health within the social and physical environment. and derive meaning	Ability to interpret and evaluate medical information, information on risk factors and/or information on determinants of health within the social and physical environment. and derive meaning	Ability to make informed decisions on medical issues or make informed decisions on factors and/or information relating to determinants of health within the social and physical environment.

Table A3
Participant eligibility criteria.

Inclusion Criteria
• Aged 18 or over. • A registered healthcare professional within Australia. • Currently practicing within private practice. • Have completed a degree level or higher in a physiotherapy course, or similar program. • Have used the VR-based pain management system. **Exclusion Criteria** • Have not used the VR system within the last 12 months. • Do not speak fluent English. • Not willing to participate in recorded interviews.

Table A4
Unified Theory of Acceptance of and Use of Technology (UTAUT-2) and Integrated Model of Health Literacy (IMHL) illustrative quotes from interviews.

UTAUT-2 Construct	Code	Quote
Performance Expectancy	Patient expectations / beliefs / readiness	• *"Is it useful? I think it is, I believe it is, but for a specific subset of people, I feel." [PT01]*
	Provision of additional narratives	• *"If we were to put them in the headset and they just do the modules, that's the end of the treatment session […] the treatment effect would be smaller than if you are spending time with them really unpacking it." [PT08]*
	Contraindications	• *"Head symptoms, whether its migraine, dizziness, the fear of people actually using a VR unit, of they've used it and had a bad experience." [PT04]*
	Relevance	• *"I think with the VR you can make it more personal because you're really working one-on-one with somebody you can really choose." [PT03]*
	Immersive learning	• *"I think that the combination of the information and the experience within the virtual environment is very powerful. And that's very hard to, uh, to do yourself, I find." [PT01]*
	Comparison to conventional methods	• *"What can this tool do, that I cannot do myself?" [PT01]*
	Entertainment	• *"I think it's super important we make it fun, and we don't make it about 'exercise'" [PT04]*
Effort Expectancy	Digital competency	• *"I think if you are doing VR, you really need to have a practice." [PT03]*
	Time available	• *"Say a 30-minute session, even that to set up the module, and get the person in it, feels a little rushed to get everything done." [PT09]*
Social Influence	Patient expectations / beliefs / readiness	• *"that's what the other colleagues said as well, they said, Its just a cool thing, isn't it? It's nothing more than that." [PT01]*
Facilitating Conditions	Time available	• *"I only run them in hour sessions still, and even in that session, they might only do 15 min of VR, but I wouldn't grab a VR out in half an hour session in any hour." [PT04]*
	Accessibility to technology	• *"The world is going very tech and it's very intuitive and not over the top in terms of accessibility." [PT04]*
	Support materials and training	• *"I think it's the, the coaching (from clinicians) that follows that needs time and investment." [PT08].*
Hedonic Motivation	Immersive learning	• *"Sometimes they take it off and say, thank you for letting me be in a different world for a little while." [PT01]*
	Entertainment	• *"If they are having fun, I guess there's a lot more openness to the service that we're providing." [PT10]*
Price Value	Compensability	• *"I thought if I had to transfer the cost to the client, it wasn't onerous." [PT06]*
	Comparison to other methods	• *"Well it definitely costs more than other (pain science) tools because other tools are either free or pretty low cost". [PT05]*
Habit	Reproducibility	• *"It requires a lot less of me, psychologically, emotionally, to take someone through that process (PSE)." [PT05]*
IMHL Construct		
Access/obtain information relevant to health		• *"When you're trying to build someone's health literacy, you need a variety of media to do it […] so VR is another platform that could really help. [PT04]*
Understand information relevant to health		• *"I think the immersion […] it's another way of learning. Its not just audio, it's not just visual […] it's that procedural knowledge. So in terms of how powerful it is to influence someone's health literacy, it's quite an efficient way." [PT04]*
Process/appraise information relevant to health		• *"I think the way the information is delivered, with the visual things, lends itself to helping people be critical about (other) information" [PT01].*
Apply/use information relevant to health		• *"I think it is really that ability to give them an experience, that really sets them up nicely to have a conversation." [PT05]*

Appendix B. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.pec.2024.108179.

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