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Digital resources for pain management: Psychologists' perspectives and suggestions

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Abstract

Chronic pain has high prevalence, complexity, psychosocial and economic impact. There is a growing interest in the development and use of digital resources accessed through electronic devices for pain management. Qualitative interviews with eight registered psychologists explored their perspectives of and suggestions regarding digital resources for pain management. Six overarching themes were identified, indicating that digital resources are perceived as useful. Difficulties were identified pertaining to digital social support and client-decision making, plus perceived barriers and facilitators for digital resource use. Participants offered suggestions about what an ideal digital resource would incorporate. These findings may inform the modification of existing resources, and the formulation of additional appropriate and tailored co-designed digital resources for the management of chronic pain.

Keywords: Digital resources, pain management, psychologists, qualitative, thematic analysis

Digital Resources for Pain Management: Psychologists' Perspectives and Suggestions.

Chronic pain is a worldwide epidemic. It is estimated that one in five Australians are suffering from this condition, costing the nation approximately \$34 billion per annum (Pain Australia Factsheet 2, n.d.). Chronic pain is defined as persistent pain, such as feelings of discomfort or unpleasant sensations of varying severity, that persist for longer than three months, extending beyond the normal acute healing timeframe (Crowe et al., 2017). This creates complexity since chronic pain can exist without an associated physical injury or tissue damage. Added to this, perceptions of the type and intensity of pain vary considerably between individuals and how the pain interferes in their daily activities (Lalloo, Jibb, & Rivera, 2015; Roditi & Robinson, 2011). Its multifaceted nature is associated with prevalent co-morbid physical disability and psychological distress such as anxiety and depression (Crowe et al., 2017; Gatchel, Peng, Peters, Fuchs, & Turk, 2007; Roditi & Robinson, 2011). For that reason, the subjective nature of pain contributes to why there is no immediate cure or solution. Thus, pain often persists for many years or can be lifelong (Crowe et al., 2017).

As common pharmacological therapies and surgery are often ineffective (Butchart, Kerr, Heisler, Piette, & Krein, 2009; Carpenter, Stoner, Mundt, & Stoelb, 2012), psychological approaches are commonly used as a form of pain management. Psychologists assist clients with chronic pain to modify and cope with prevalent psychological distress (i.e. unwanted thoughts and emotions) and lifestyle impacts (e.g. reduction in working capability) to enjoy quality of life despite pain (Roditi & Robinson, 2011). The gold standard to address these impacts are through the use of cognitive behavioural methods, such as challenging and modifying negative thoughts and beliefs about pain, relaxation and pacing techniques, and pain acceptance methods (Jensen & Turk, 2014; Roditi & Robinson, 2011). The ultimate

treatment model involves interdisciplinary care in the context of a pain clinic (Burke, Mathias, & Denson, 2018).

However, in Australia, there are long waiting lists (between twelve months to two and a half years) for pain and psychological services in a pain unit, and associated costs, making in-person treatment for pain management difficult (Burke et al., 2018). Similarly, access to private psychologists in the community can be expensive and also may require a waiting period (Australian Senate Select Committee on Mental Health, 2006). Thus, there is a need to improve accessibility and provide more pain management options at low cost (Butchart et al., 2009; Carpenter et al., 2012; Rini, Williams, Broderick, & Keefe, 2012). As such, there has been increasing interest in and development of non-pharmacological approaches such as digital resources (Bender, Radhakrishnan, Diorio, Englesakis, & Jadad, 2011). These resources are available through an internet connection and can be accessed through a computer, mobile phone, and other electronic hand-held devices, via different formats such as a website, application (app) or program (Rini et al., 2012). Digital resources aim to promote health behaviour change to develop self-efficacy, by providing information, videos, courses and programs regarding pain and self-management skills, and social support in the form of personal stories, forums and groups (Lalloo et al., 2015; Murray, 2012).

Digital resources can be accessed without medical approval or supervision of a health professional, thus simply requiring self-motivation and efficacy (Murray, 2012). The advantage of utilising digital resources is that they are accessible and can compensate for long waiting lists for in-person treatment, are cost-effective, and convenient, particularly given the high internet use among the Australian population (approximately 80%) (Murray, 2012). In particular, people who have financial issues (McCloud, Okechukwu, Sorensen, & Viswanath, 2016), difficulties with physical mobility and psychological health (Bergman et al., 2013),

and who live in rural or remote locations (Mann, LeFort, & VanDenKerkhof, 2013; Murray, 2012) can benefit from accessing digital resources to manage chronic pain.

Despite psychologists' involvement in the development of digital resources for clients with chronic pain, to date, no studies have explored psychologists' perspectives and attitudes towards these resources (Mann et al., 2013; Ruehlman, Karoly, & Enders, 2012). The present study aims to address this gap in the literature with an in-depth qualitative exploration addressing the following research question: "What are psychologists' perspectives of and suggestions regarding digital resources for pain management?" This question aims to specifically address how psychologists perceive digital resources as useful or effective, their views of the associated barriers and facilitators towards digital resource use by those with chronic pain, and suggestions for ideal digital resources for pain management.

Method

Participants

For inclusion in the study, participants were required to be psychologists who regularly treat chronic pain clients, currently working in Australia and fluent in English. Seven participants were recruited via direct approach through networks of the second author, and one was recruited through snowball sampling, where a participant relayed details of the study to a psychologist eligible to participate. The sample comprised of eight registered psychologists, three men and five women, currently working with clients who live with chronic pain in Adelaide, South Australia. All participants held full registration with the Psychology Board of Australia. Seven psychologists were endorsed in Clinical, Health or Organisational Psychology, while one psychologist held general registration with no endorsement. The length participants had been working with clients with chronic pain ranged from 4 to 25 years, with the average length being 13 years.

Procedure

The University of Adelaide Subcommittee for Human Research Ethics in the School of Psychology approved the present study (18/32). Participants were provided with an information sheet (see Appendix A) outlining details of the study and written and verbal informed consent was obtained prior to conducting interviews. Participants were aware that involvement in the study was voluntary and that they could withdraw at any time. Upon consent, the first author conducted in-depth semi-structured interviews at a convenient time and location for participants. The interview guide (see Appendix B) consisted of open-ended questions and prompts, with questions based upon existing studies examining client perspectives of the use of digital resources for pain (Portelli & Eldred, 2017) and mental health conditions (Donkin & Glozier, 2012). Questions explored participants' perceived value of digital resources for pain management, associated barriers and facilitators, and suggestions of what an ideal resource would incorporate for pain management. Six interviews were conducted face-to-face at the participant's location of work in Adelaide, and two occurred via telephone. Interviews ranged between 26 and 54 minutes, with the average length being 42 minutes. Recruitment ceased following the eighth interview as saturation was reached, meaning no new patterns or themes were found within the data relevant to the research question (Braun & Clarke, 2006, 2013). With participant consent, interviews were audio-recorded and transcribed verbatim by the researcher. A number was assigned to each interview, and identifiable information was removed to ensure the anonymity of participants.

The first author maintained an audit trail, noting all aspects of the qualitative research process. This allowed for consistent comparison of data at each stage of analysis, thereby enhancing rigour (Tracy, 2010). In addition, the first author maintained a reflexive stance by documenting personal influence and bias between and during interviews to ensure

transparency. Reflexivity, through maintaining an audit trail, and through discussion between the two authors, ensured that bias was recognised and minimised to enhance trustworthiness and rigour (Braun & Clarke, 2016, 2013). This process included careful selection of illustrative quotes for each theme. In qualitative research, there is no process for inter-rater reliability (as this is a quantitative concept). For rigour, all analyses were discussed to consensus: the first author produced the themes, and the second author checked these against the raw data. Reflexivity is one aspect of transparency, which is a requirement for successful qualitative research as it enhances the credibility and sincerity of research findings (Tracy, 2010).

Thematic analysis is a widely accepted qualitative research method (Braun & Clarke, 2006, 2013; Pope & Mays, 2006). This involves identifying, recording, and analysing relevant themes or patterns in qualitative data. Themes are identified when patterns or meaning in the data hold relevance to the research question (Braun & Clarke, 2006, 2013). Thematic analysis is considered a flexible analytical approach, by allowing deep exploration, interpretation and understanding to provide a rich and ‘thick description’ of the data (Braun & Clarke, 2006, 2013). Throughout the analysis, inductive (themes generated were data-driven) and deductive (themes generated were theoretically driven) approaches, and semantic (codes capturing explicit meaning) and latent approaches (codes capturing implicit meaning) were used, by extracting meaning from the data obtained (Braun & Clarke, 2006, 2013).

Results

Overview

Analysis of the data resulted in six overarching themes and their respective sub-themes. Overarching themes included: digital resources are perceived as useful for pain management; consumer-led digital resources related to social support are a “double-edged

sword”; difficulties for client decision-making about digital resources; barriers and facilitators (categorised by accessibility and support) towards digital resource use for pain management; and participant suggestions of ideal digital resources for pain management.

Digital resources are perceived as useful for pain management

Promote active self-management

Participants described that clients are actively involved with their pain management when they are involved in self-directed information seeking.

... it's helpful in a sense for the person to take charge of their difficulties [as with] chronic pain often the person comes rather passive and a sufferer so this gives a person a chance to discover on their own. (Participant 6, lines 1068-10)

In addition, digital resources as an adjunct to therapeutic sessions were perceived as useful, to augment clients' knowledge of pain management skills and enable the client to actively guide discussion with a psychologist and other health professionals regarding resource use and those resources' perceived effectiveness.

... so if someone is sort of coming in they might want to talk about a lot of individual things but there might be some gaps in their general knowledge about skills so it can kind of be propped up the self-management by going online having a look and then saying 'this is what I've tried this is how it worked'. (Participant 8, lines 1438-1444)

Ease of self-monitoring

Digital resources, particularly applications (apps), were considered to be useful aids in self-monitoring because of their ability to serve as accurate reports of physical pain, as well as the impacts of pain such as daily activities, exercise and periods of social interactions. The digital approach was seen to be beneficial for compensating for perceived issues with losing hard-copy notes and forgetting management strategies stated in a session with a psychologist.

... one of the main things that I struggle with and that I find my clients struggle with pain management is monitoring and tracking... there's a real area there where rather than people you know taking their self-records around in paper or trying to remember it when they get home... (Participant 5, lines 719-736)

Participants expressed some issues with self-monitoring, in relation to increasing the focus on physical pain and distracting focus from psychosocial components that were explicitly stated as the goal of pain management. Thus, a necessity for psychologists to understand their reasoning behind recommending digital resources to facilitate self-monitoring of pain was described.

... you've gotta be a bit careful about who it is and why you're getting them to do it I think cause you're potentially reinforcing all of the focussing on pain... (Participant 7, lines 1418-1419)

Enable clients to re-visit content

The ability to re-visit content, irrespective of the period of time following therapeutic sessions, was perceived as useful, to consolidate and reintroduce knowledge of self-management strategies and skills and minimise practicality issues of misplacing hard-copy documents.

I always try to give handouts and explanations and even come back to certain points in future sessions with clients so we can really consolidate what we've been through, having said that I realise some of these things get lost along the way... and once you fast forward six months six years you know... all of a sudden you don't have access to it anymore. (Participant 5, lines 972-977)

Accessible comparative to in-person pain management services

Participants stated that digital resources are useful as an adjunct to attending appointments, due to the expense and long waiting lists for accessing tertiary pain services.

I think in the private sector where there's not a lot of opportunity for pain or access for pain management it's pretty expensive if people can do some stuff online in-between their sessions they get a bit more bang for their buck. (Participant 8, 1442-1444)

In addition, digital resources were seen as highly useful for clients residing in rural and remote locations, due to difficulties with mobility and cost of transport.

We've had major issues with people being able to attend appointments particularly country people so access is limited to people in that respect, so it has really opened up the door for people. (Participant 3, lines 310-312)

Consumer-led digital resources related to social support are a “double-edged sword”

Participants deemed consumer involvement (i.e. clients with chronic pain) in the development and maintenance of digital resources essential, due to the client's ability to better comprehend, and thus tailor digital resources to the emotional and functional needs of chronic pain sufferers.

We need to preferably experience something for ourselves to you know properly understand it to see the impact it has emotionally functionally and otherwise as well as what kind of strategies may or may not work depending on you know the type of person. (Participant 5, lines 816-818)

However, participants explicitly and implicitly expressed that consumer-led digital resources, specifically forums and groups that provide social support are a “double-edged sword”. Presented below are descriptions of how digital social support was perceived as both useful and problematic.

Digital social support perceived as useful

Digital social support was seen as useful to promote social connectedness due to the high prevalence of loss of personal and social relationships experienced by people with chronic pain. This was largely attributable to a lack of understanding of chronic pain and its associated impacts to one's lifestyle (e.g. inability to work resulting in financial difficulties).

... if you think about how people with pain you know find things socially, inter-personally you know family don't always understand, friends back away, people lose jobs they can't work anymore... so online stuff becomes quite powerful then because it's a way of connecting with people... (Participant 3, lines 390-394)

Social connectedness was perceived to be enhanced when clients feel a sense of relevance by interacting with others that have lived experience of pain. Emotional understanding, comparative to technical and evidence-based understanding by health professionals, was considered more important to facilitate connectedness.

Digital social support perceived as problematic

Problems identified with clients using digital social support included negative attitudes and judgements by others, and personal opinions resulting in ill-informed treatment choices, influencing the idea of a pain solution and consequently deterring clients from evidence-based pain management strategies. These problems were seen to influence and exacerbate the client's psychological vulnerability. Therefore, the necessity of health professional moderation and involvement was described.

... unfortunately people are quite judgemental online as soon as you kind of get behind a computer screen... so I think if there was some level of discernment and moderation, strong rules that were enforced well to keep people safe from trolls or other unwelcome judgements. (Participant 2, lines 243-254)

Difficulties for client decision-making about digital resources*Difficulties for clients assessing evidence-based information and treatment*

Participants expressed the difficulty for clients when seeking digital information to discern evidence-based from information lacking credible research. For example, personal experiences or perceptions of certain pain treatments shared by others can be influential to the client's treatment pursuits and thus potentially problematic.

The problem I think with online stuff is working out what's reasonable sensible up-to-date information versus what's information that's put up with someone else's lens...

(Participant 1, lines 31-34)

Following advice about non-evidence-based treatment was perceived to result in several consequences. This was in relation to clients becoming consumed with seeking pain solutions that are often non-effective in removing pain, resulting in financial strain and negative consequences for psychological health and personal relationships.

... people will be chasing the magic pill or the magic cure and spend lots of time and energy researching and focussing on those things spending money and then potentially not get anywhere... the trickle-down effects can be pretty big. (Participant 7, lines 1387-1391)

Thus, the importance of seeking treatment advice from medical health professionals was noted. In addition, the necessity for digital resources to incorporate evidence-based information was stated, enabling merit, quality and suitability of pain management resources. Such information, contributed by professional bodies, pain organisations and associations was highly recommended, due to its perceived accuracy and credibility.

Clients seek information for pain solutions

Participants highlighted that most clients seek digital information for the cause of pain and solutions for pain, due to attitudes of viewing chronic pain biomedically and that it can be cured or fixed. This was considered to exacerbate pain and limit the focus and goal of seeking and utilising self-management strategies. Pain acceptance was described as a lengthy process, which may never be achieved for some clients, and thus the importance for clients to understand and pursue a self-management approach prior to the utilisation of digital resources (e.g. programs, courses) was stated.

... they're not looking for management because 'I don't want to manage it I want to get rid of it' so there's a bit of work you have to do before you can bring those things in... (Participant 8, lines 1490-1498)

Despite participants expressing digital resources as useful, presented below are perceptions of barriers and facilitators towards digital resource use for pain management.

Perceived Barriers - Accessibility

Older age

Age was described as a factor that influences attitudes toward technology and digital resource use, with a consensus that those above the age of sixty are less inclined to utilise these resources for pain management. This was due to participants explicitly expressing that older people lack exposure to technology, resulting in reduced knowledge and skills - such as difficulties with self-monitoring and website navigation.

... there is still definitely barriers for people of an older generation who haven't had a lot of exposure to technology to be able to use it effectively. (Participant 2, lines 168-169)

Multifaceted nature of chronic pain

Co-morbid physical pain, medication side effects and poor psychological health such as anxiety and depression were identified as barriers. These factors were perceived to limit concentration, and due to the largely independent nature of digital resource use, pose difficulties for people to absorb and comprehend information, or hamper motivation to seek, utilise and maintain resource use.

... wanting you know to sit down and do something like that means they've gotta be able to concentrate, they're not having necessarily anyone sitting with them and being able to discuss it with them... (Participant 3, lines 500-504)

Digital resources viewed as irrelevant

Digital resources were viewed as irrelevant by some clients, as pain management courses, programs and information websites promote self-management strategies. Participants believed that clients may fixate on and seek pain solutions and overvalue biomedical causes of pain. Thus, participants saw this as a major barrier due to the lengthy process and difficulty of understanding and practising self-management.

The sense of self-management that it's not promising a cure... I think that's a challenge and that can be a turn off because it is work it is about you know checking on your symptoms it is about pacing yourself changing your behaviour. (Participant 8, lines 1538-1546)

Cost of internet and devices

Participants flagged socio-economic issues, such as cost, as barriers due to requiring internet connection and technological devices to utilise digital resources.

So you've got to have a computer or a what's the thing called the magic phone a Smartphone or a iPad or something like that which costs money to get and it costs

money to pay for your internet access or Wi-Fi or whatever. (Participant 4, lines 556-558)

Participants discussed the common assumption regarding ease of access to internet and technology, irrespective of socio-economic status. A participant described her own research and that of others which contradicted this assumption.

... we've realised how few of our patients have got [Smartphones and internet] in some populations and so you know I think you know it's something you can't take for granted. (Participant 1, lines 64-67)

Residing in rural or remote locations

Poor internet connectivity was perceived as a barrier, particularly for clients residing in rural or remote locations. This was supported by participants receiving client feedback on their inability to use digital resources.

... people have said 'oh we don't have good internet service around here you know so not much point recommending I go online because it will drop out [and] I won't be able to'. (Participant 3, lines 324-328)

Complex information

Digital information and content containing complex terms and medical jargon were perceived to restrict clients' motivational ability to engage with, utilise and maintain digital resource use. This was seen to exacerbate psychological vulnerability and impact on the client's ability to learn and apply knowledge or strategies to their daily living.

If we make things too complex then generally people kind of shut down in terms of not bothering to take the understanding in... (Participant 5, lines 955-959)

Clinical work as a priority

The necessity of prioritising clinical work over digital resource development was stated, due to the restrictions of available in-person treatment options in tertiary pain services.

When you've got a three-year waitlist and you know trying to get people through the clinic that's not something I guess that takes priority for the clinicians. (Participant 1, lines 94-95)

Perceived Barriers - Support

Need for human contact

The inability to incorporate human contact was seen as a limiting factor of digital resources compared with the multiple interactions provided with face-to-face contact. As such, participants perceived that the majority of clients require discussion and support prior to and following resource use, to promote understanding regarding the content and self-management principles that may be lacking.

... majority of people probably need a little prompting a little help and a motivating factor as well so I think that would be still be important. (Participant 6, lines 1190-1195)

Negative digital social support

Problematic perceptions of digital social support such as forums or support groups were raised, based on client feedback. This was in relation to other people's negativity and the provision of unwarranted advice about particular treatments. This resulted in deterring clients from seeking this support due to the inability of meeting needs of connectedness and understanding.

Yeah and we've had people say... 'oh look there was this support group that I thought I'll take a look at but I couldn't stand the you know the negativity. I didn't wanna get all this advice from people I just wanted to have people say they understood they've

got it I didn't want them to come back with oh you should try X Y Z because it worked for me'. (Participant 3, lines 379-382)

Perceived Facilitators - Accessibility

Younger age

Participants perceived those within the age demographic of eighteen to twenty-five to be more inclined to use digital resources, largely due to their social media connections.

Clients were perceived to have greater technological competence due to technology exposure and access embedded into their culture while young.

... I would imagine and certainly those sort of eighteen to twenty-five age group that I do see yes they're all sort of connected online. (Participant 4, lines 565-569)

Access to technology to self-monitor

Participants described the ease of applying self-monitoring activities to daily life, due to prompts and reminders by apps that are easily accessible through mobile phones. Daily prompts were seen to encourage internalisation of these activities to promote a routine for self-management strategies.

... the potential to have you know an alarm that comes up every once in a while... becomes easier to just realise that's what you gotta do at that time of the day.

(Participant 5, lines 774-780)

Willingness to self-manage

Clients who have high health consciousness and are thus willing and motivated to self-manage were seen as more prepared and inclined to seek and utilise digital resources for pain management. This was more evident for those who have had many unsuccessful treatment attempts for remedies and solutions for living with their pain.

... there's people who come in and say 'I've had all this treatment none of it has worked I need to do something about this' so they're really already ready to go.

(Participant 6, lines 1294-1298)

Inexpensive resources

The cost of digital resources was highlighted as an important motivator for their use, facilitating engagement and interest when websites, courses, and programs are at minimal or no expense.

... these are things people can just access, obviously they're paying for their internet, but it's not having to pay for something immediately unless they wanna join up to something, and that program is a small fee, the others are research based and so you get the courses for free. (Participant 3, lines 305-308)

Convenience

Digital resources were seen as a convenient form of pain management, due to views of ease of access and the ability to use at one's volition. This was stated in comparison to attending appointments, with limited available sessions and contact with a psychologist, and thus time constraints to work on self-management activities.

... it lets people chip away at it rather than say you know you've got your one hour for the next two weeks with a psychologist get as much done as you can in that one hour and then we'll see you again in a couple of weeks... (Participant 5, lines 986-990)

Convenience was also mentioned due to the limitations of physical pain and work commitments to attend appointments, thus reflecting the flexibility of use of digital resources for different circumstances and lifestyles.

Credible digital resources

Evidence-based resources that are developed and maintained by health professionals or professional organisations were perceived as essential, for facilitating the client's confidence and trust that the site contains accurate information. This was seen to minimise confusion for clients and to avoid self-navigation of information to discern what information is accurate, or not, and what to utilise.

... I think if something's clearly been endorsed by health professionals or things like that then at least they've got an opportunity to feel more confident in the message it's sending. (Participant 8, lines 1558-1562)

Diverse modalities of information

Digital resources providing various modalities of information, such as audio, visual and auditory, were perceived to cater for individual differences and enable clients to select their preferred modality or modalities for optimal processing of information. Doing so was seen to facilitate client engagement. These views were stated in comparison to in-person services where health professionals largely provide hard-copy resources.

... when you get online you've got access to other modes... so you can absorb information quite differently. (Participant 3, lines 395-400)

Perceived Facilitators - Support

Practitioner-directed support

Explicit and implicit expressions of the importance of providing support and guidance to clients regarding digital resource use was described. A participant spoke about the importance of recommending diverse digital resources, assisting clients to discern evidence-based digital resources from non-evidence-based, and collaborating with the client following use to seek and obtain feedback on what was learnt and how they perceived its effectiveness.

I think from our perspective it's about providing options, helping people to work out what's good quality and what's not, and you know talking about that later on you know 'what did you find out, how did that go for you, does it actually increase your support, does it help you to you know to manage this better, or has it just been an exercise you decided to try and let go?' (Participant 3, lines 428-432)

Accessing digital resources, such as videos, in session with clients was seen as important to facilitate awareness, engagement and interest. Promoting these for use among clients' social supports that lack knowledge and understanding of their chronic pain experience was also noted to enhance engagement.

I watch the first six-minute video with the person in session and we talk about it in here so I show them how to access it say 'look this might be something interesting to you' or they can show their family or other people at home that don't understand... (Participant 8, lines 1464-1467)

Most importantly, prior to recommending a digital resource, participants expressed the necessity of self-testing, to ensure the resource is tailored to the client's needs in terms of their lifestyle and physical, cognitive and emotional functioning.

Family support

Participants perceived that clients' supportive relationships, such as those with partners or family, may motivate and facilitate digital resource use. This was seen to be particularly useful when psychological distress is a limiting factor to self-directed resource seeking for pain management strategies and activities.

... yeah sometimes it helps if they've got supportive partners or family because they can sort of encourage people to go off and do these self-management things and that

can be particularly helpful actually if people are particularly depressed or anxious...

(Participant 7, lines 1306-1309)

Positive digital social support

The importance of recommending digital social support to clients was expressed, as participants have received encouraging and positive feedback from clients regarding forums and groups that have provided connectedness and understanding from those that share similar experiences.

... usually clients that I have suggested it to and mentioned some of those I guess facilities online they seem to benefit and have that been a motivating factor for them to be able to connect with others. (Participant 5, lines 836-838)

Participant suggestions of ideal digital resources for pain management

Necessity of eradicating barriers

The need to eradicate barriers associated with digital resource use was highlighted, particularly concerning cost, accessibility and quality. The need for additional client feedback regarding whether digital resources were utilised and how effective they were, was described by participants. This feedback can be used to develop additional, effective and complementary digital resources suited to the client's needs.

... it's looking at the cost of stuff, and the accessibility and you know the quality of that stuff and getting enough feedback from people so that we know that if we were recommending something that there's some good information behind it. (Participant 3, lines 464-470)

"Room for improvement"

There are obviously some things that already exist, but I think there's always room for improvement and greater efforts and investments being made into quality online platforms for people to utilise. (Participant 2, lines 266-268)

Due to a consensus that digital resources are lacking for pain management, requiring further development and improvement, and emphasising the importance of ensuring resources are evidence-based, participants expressed what ideal digital resources for pain management would entail.

Appropriate development of digital resources

A multi-disciplinary approach, such as collaboration amongst researchers, health professionals and those with chronic pain was stated as essential for the development of digital resources.

I would very much like an approach to occur which has you know the researchers, the clinicians and the lived experience people but that has that kind of an almost top down approach where it gets filtered through you know from psychology, psychiatry, GP's (general practitioners) and so on... (Participant 4, lines 709-712)

Simple digital information

Digital resources (e.g. websites) incorporating simple and straightforward information were perceived as vital due to the physical, cognitive and psychological constraints associated with chronic pain. Tailoring information to lay understandings was also described.

... I think for a lot of individuals you know pain is in some ways it's such a primitive thing isn't it you know? Well my view is that we all end up a little bit like cave men women when we are in a lot of pain and we just need something simple and effective at that point. (Participant 4, lines 660-665)

Pain education

The importance of digital resources providing education on psychosocial components of pain such as managing time, emotions and focussing on values rather than physical pain itself was described. Focussing on value-based living was perceived to promote interest and engagement with a digital resource compared with pain management courses largely focussing on physical pain. Participants viewed that digital courses do not currently include the psychosocial components that are deemed as essential to pain management.

So learning some stuff around education, time management, emotional management, stress management and values... that's I think a really important place to be cause otherwise I think pain management courses can just sound like pain management courses... (Participant 5, lines 905-914)

In addition, incorporating information illustrating evidence for and against treatments and strategies were perceived as important, highlighting the necessity for clients to understand and discern evidence-based from non-evidence-based information and treatments.

Promote self-management

Participants highlighted the need for digital resources to promote active self-management and a sense of ownership to enhance clients' sense of control. This was thought to be achieved by promoting a focus on pain and psychosocial management as opposed to information and social support resources advocating for pain solutions. The need for clients to make educated choices regarding digital resources to promote self-management was expressed, to limit reliance on health professionals. However, health professionals were seen as vital to assist and guide clients with digital resource use.

... so I think it's kind of it's about giving people permission to pick and choose and know what's best for them but from making I guess informed choices rather than just

follow this program and it'll take you to the pot of gold at the end of the rainbow...

(Participant 8, lines 1605-1613)

Digital resources promoting relevance

Digital resources promoting material relevant to clients' chronic pain condition and circumstantial needs was stated as essential, to aid in engagement with a digital resource. The potential for and usefulness of artificial intelligence was also mentioned to enable these resources to meet individual needs.

At the moment I think it's mainly done by human beings maybe eventually you'll have a website-based stuff that will actually kind of detect what would be the key issues for that person and can draw them in appropriately... (Participant 6, lines 1216-1218)

Tailoring to situational changes

Digital resources that remain accessible were perceived as crucial due to circumstantial changes during the lifespan. The need to provide support for specific situational changes was described, such as scenarios and strategies focussing on loss of personal relationships and working incapability that are prevalent among those with chronic pain.

I think it isn't something that someone does once and now 'I've done that program and I know all about it' because their circumstances could be different and the impact of their pain on their life could be different... (Participant 8, lines 1633-1641)

Discussion

The purpose of this study was to explore psychologists' perspectives of and suggestions regarding digital resources for pain management, with six themes generated from the data. Digital resources such as information websites, apps, programs and courses targeting

psychosocial pain management were viewed as somewhat effective or useful for clients, supporting previous research findings (Bender et al., 2011; Murray, 2012). Studies have widely stated digital resources eradicate barriers associated with attending appointments, such as health care costs (Bender et al., 2011; Portelli & Eldred, 2017), time constraints - due to convenience of resources to do in one's own time (Nevedal, Wang, Oberleitner, Schwartz, & Williams, 2013), and assisting people in isolated areas such as rural or remote locations (Lalloo et al., 2015; Mann et al., 2013; Murray, 2012).

It is worth acknowledging that the majority of research describing barriers and facilitators regarding digital resource use for chronic pain is largely based on assumption (Mann et al., 2013; Mohr, 2009). Thus, there are limited studies that provide empirical data and factual statements or perspectives from clients or health professionals (Bender et al., 2011). For example, this study found that clients residing in rural or remote locations faced barriers for using resources due to poor internet service or connectivity, with only one other study assuming this may be a potential barrier (Murray, 2012). Additionally, Murray (2012) argues there is a high use of internet among Australians, enabling ease of digital resource use. However, the cost of technology to enable the use of the internet was seen as a major barrier in this study, consistent with other research findings (Parker, Jessel, Richardson, & Reid, 2013), contradicting the assumption of digital resources eradicating all barriers. This study confirms and augments perceived barriers and facilitators associated with digital resource use through empirical findings from a specialised psychological perspective.

This study highlighted various instances of how digital resources may fulfil the need for autonomy (self-regulation, organising and control of goals and behaviour), competence (to feel capable and adapt to one's environment to ensure actions produce valued results or outcomes), and relatedness (longing to interact, connect with and form meaningful

relationships with other people) among chronic pain clients, all of which are encapsulated within a theory of motivation known as Self-Determination Theory (Deci & Ryan, 2000, 2008). For example, digital resources (e.g. applications) were described as useful due to the ease of ability to self-monitor pain and activity levels using a mobile phone, which may improve self-regulation skills (Lalloo et al., 2015). This may lead to the internalisation of self-monitoring behaviours, thus creating autonomous motivation (Ryan et al., 2008).

Additionally, resources were seen by participants as useful to promote active self-management; thus, participants valued the role of the client to develop self-efficacy. For example, clients can use these resources at their own volition (enhancing autonomy) due to their timeless accessibility, resulting in convenience and flexibility of use (Nevedal et al., 2013). In addition, participants expressed that there may be more engagement and interest among clients when resources incorporate diverse modalities, thereby enhancing intrinsic motivation. The above factors, combined with the client's willingness to self-manage, may facilitate autonomy and additionally competence, to enable greater adherence to digital resources to maintain their use (Ryan et al., 2008; Yardley, Morrison, Bradbury, & Muller, 2015). Once willing to act on a health behaviour, a person is more likely to learn and apply these strategies to their daily living (Ryan et al., 2008).

Despite digital resources being perceived to promote self-efficacy, autonomy and competence, there may be challenges for client decision-making (as highlighted by participants). For example, clients may seek digital information and advice from discussion forums for pain solutions or remedies. This may challenge external motivation due to the rarity of pain cure (Pain Australia Factsheet, 2016). Seeking pain solutions was seen as problematic for psychological vulnerability and social relationships, and a barrier to resource use due to pain management resources commonly promoting self-management principles

(Butchart et al., 2009). This may influence, or be influenced by, associated ill-informed treatment choices or accessing non-evidence-based information lacking credibility and trustworthiness, suggesting information is inaccurate, not up-to-date and does not align with pain management principles. Accessing evidence-based information was perceived as difficult for clients due to the challenge of discerning what evidence-based information is from what is not (in part due to the abundance of information), exacerbating the aforementioned problems (Murray, 2012). This could be attributed to clients viewing unguided resources (e.g. websites and social platforms) that do not have guidance or assistance from a health professional (Buhrman, Gordh, & Andersson, 2016; Rini et al., 2012). Surprisingly, literature has not thoroughly explored how or why a lack of evidence-based information and treatments may be a challenge or problematic for people accessing digital resources (Nevedal et al., 2013). Therefore, this study contributes to this gap in knowledge.

The present study highlighted a potential intervention from psychologists, in terms of recommending and facilitating credible digital resources to increase client motivations. That, in combination with psychological interventions, may potentially enhance client self-determination and self-management, by providing education on pain management and taking control of their pain and associated behaviours (Jensen & Turk, 2014; Ryan et al., 2008). Additionally, digital resources tailored to prevalent and specific circumstances and needs (i.e. loss of social supports, inability to recommence work) may enhance competence (as suggested by participants) (Ryan et al., 2008). This is supported by a study incorporating key intervention features to enhance competence by providing tailored feedback to clients following digital intervention use, and incorporating personal stories shared by others (also enhancing relatedness) (Yardley et al., 2015).

According to Deci and Ryan (2000, 2008), competence is diminished when health behaviour change and its associated challenges are too difficult. This study highlighted that digital resources are difficult to utilise and maintain when a client lacks concentration and motivation, which was largely attributable to physical pain and psychological distress. Murray (2012) concurs with these findings stating that accessibility is impacted by this distress, creating difficulties as a high level of motivation and self-determination is required when independently using a digital resource. This suggests the benefit of another person as a motivator or support (as expressed by participants). For example, a health professional may be required when clients lack technical skills or ability (Ryan et al., 2008), such as older aged clients - as expressed by participants in the present study.

Support and encouragement from family and friends may facilitate intrinsic and extrinsic motivation to seek and maintain resource use, aligning with research illustrating that external motivation facilitates internalisation of behaviours (Deci & Ryan, 2000, 2008). In addition, clients partaking in social forums and groups may facilitate feelings of relevance to their lifestyle and pain experiences due to interacting with those with lived experience of pain. Research supports these findings by illustrating how vital social support is for those with chronic pain, as forums and groups provide a supportive community of self-expression, positivity and support to reduce social isolation and improve mental health outcomes (Lalloo et al., 2015; Slater, Dear, Merolli, Li, & Briggs, 2016). Furthermore, psychologists recommending, guiding and assisting clients with digital resource use in sessions strongly links with, and contributes to, fulfilling the need for relatedness (Deci & Ryan, 2000, 2008; Teixeira et al., 2012). The need for competence may also be fulfilled when accessing digital resources (e.g. videos) in therapeutic sessions to enable the client to develop feelings of mastery (Deci & Ryan, 2000, 2008; Teixeira et al., 2012).

The need for relatedness is challenged in this study due to participants relaying client feedback of negative social support such as comments and judgements made by others on forums or groups, deterring them from future use. This may disrupt autonomy and competence and could potentially reduce the use of digital resources for their pain management (Ryan et al., 2008). As such, Deci and Ryan (2000, 2008) argue that negative social context and challenging basic psychological needs lead to poorer mental health outcomes and quality of life.

Strengths

An evident strength of this study was the use of qualitative methods (i.e. thematic analysis) to provide a rich and ‘thick description’ of the data set. Braun and Clarke (2006, 2013) state this approach is most appropriate when exploring a novel area; hence, this is the first study to qualitatively explore psychologists’ perspectives of and suggestions regarding digital resources for pain management. Therefore, according to Tracy’s (2010) ‘big-tent’ criteria for excellence in qualitative research, this is considered a ‘worthy topic’ and provides a significant and meaningful contribution to the literature.

Limitations and future research

A clear limitation of this study is the inability to triangulate the data through comparison of psychologists and chronic pain clients’ perspectives. This would have allowed for exploration of clients’ personal experiences and views, as the present study highlighted client feedback is lacking regarding the level of usability, effectiveness, and associated barriers, aligning with other research findings (Bender et al., 2011). Seeking perspectives of clients residing in rural or remote locations would be interesting in order to explore to what extent internet connectivity is an issue and or a priority for digital resource use (Murray, 2012). Despite a lack of literature pertaining to chronic pain clients’ perspectives (Bender et

al., 2011), there is no literature detailing views of psychologists (Mann et al., 2013; Ruhlman et al., 2012). Future research could triangulate their perspectives through qualitative methods. Whilst the number of participants was small, the data reached saturation: this is a strength. However, in future research, a larger sample using quantitative methods such as a survey would be a further avenue for triangulation of data.

Participants described a sense of relevance, connectedness and understanding if clients were to assist in the tailoring of pain management resources, particularly social support forums and groups. Therefore, collaboration among clients, psychologists, health professionals involved in pain management and clinicians to co-design pain management resources may be essential (as suggested by participants). However, Yardley et al. (2015) argue many resources such as considerable time and funding would be required. This aligns with the present findings that clinical work is prioritised over digital resource development due to the need to focus on current in-person pain management services (Burke et al., 2018). Interestingly, Yardley et al. (2015) argue that clients with chronic pain involved in the design and development may be problematic, as clients assume their experiences are like others experiencing chronic pain and their feedback is based on personal experience rather than from a technical viewpoint. However, based on the present study's findings (e.g. emotional understanding facilitating greater connectedness), the literature pertaining to the importance of client-centred care (Ng et al., 2012), and client feedback following use of digital resources and interventions (Yardley et al., 2015), it is evident their involvement is and would be highly valuable.

Due to the difficulties of pain management and associated impacts on personal and social relationships, social media platforms such as discussion forums are argued to be beneficial (Bender et al., 2011; Slater et al., 2016). As such, a study by Schweier et al. (2018)

highlighted predominantly positive impacts on psychological health due to achieving social connectedness, supporting this study's findings of its usefulness and facilitating client's motivation to seek digital social support. However, studies suggest there is still no clarity of the therapeutic value of such sites and their impact, with few focussing on pain-related conditions (Merolli, Gray, Martin-Sanchez, & Lopez-Campos, 2015; Slater et al., 2016). In addition, there is minimal empirical literature on the negative impacts or problems associated with digital support platforms (Merolli et al., 2015). This study has contributed to this gap in knowledge through participants conveying their clients' experiences, such as receiving personal advice from others regarding non-evidence-based treatments, with the potential for this to result in exacerbation of physical pain and psychological vulnerability, ultimately deterring clients from utilising this support for their pain management needs. Due to the above problems, it is evident that future research is required to assess, reduce and aim to prevent these problems. This may be achieved by health professional involvement through moderation of digital social platforms (as suggested by participants).

Participants in the present study compared ease of technology and digital resource use between older and younger age groups. A major barrier was perceived to be that older aged clients would be less inclined to utilise digital resources for pain management. These views may be due to the lack of technology embedded in their culture while young, resulting in less exposure to technology than those of a younger age. Chesley and Johnson (2014) term people who lack exposure as digital "immigrants" (p. 590), ultimately affecting their skills and effectiveness of technology and resource use (as highlighted by participants in this study). However, a qualitative study by Parker et al. (2013) highlighted those of an older age demographic are inclined to use digital technologies when resources (e.g. programs) are tailored to their needs, contradicting the assumption by participants they are often unwilling

and find great difficulty in utilising digital resources for their pain management. There has been limited research in exploring perspectives of older clients' use of digital resources (Parker et al., 2013). Therefore, future work is required to explore if digital resources are a viable option for their pain management (as the present study highlighted difficulties with daily self-monitoring of pain in this age group).

Client-decision making problems such as accessing and following non-evidence-based information and treatments were a major finding from this study. This largely contributed to participant suggestions of a need for improvement to develop appropriate and tailored digital resources. Support and education from health professionals to aid clients in assessing the quality and credibility of resources would be beneficial as a prevention strategy. In addition, future research is required to address additional regulatory bodies to evaluate and approve resources such as information websites and discussion forums as suitable for different client needs (Buhrman et al., 2016).

This study highlighted that practitioner-directed support could increase client interest and engagement with digital resources. For instance, motivational interviewing on the importance and potential benefits of digital resources by other psychologists in practice may facilitate this (Gatchel et al., 2007). Additionally, encouragement and support by other health professionals involved in pain management such as general practitioners, physicians, physiotherapists, chiropractors and dieticians may be essential to increase awareness and knowledge among clients of appropriate digital resources suited to their needs. Educating health professionals, particularly general practitioners surrounding the potential effectiveness of digital resources and interventions for pain management could enhance clients' perceived level of support to increase self-efficacy and engage with and maintain digital resource use (Morton et al., 2017; Ryan et al., 2008). This may be essential as a qualitative study by

Portelli and Eldred (2017) found that the majority of clients were not aware of digital services for their pain management. Educating health professionals is important, as Slater et al. (2016) argue there is limited research investigating the “real-world” potential of digital resources in daily health care practice (p. 494). Thus, future research is required to explore the potential of implementing digital resources into routine clinical practice and care for chronic pain populations (Rini et al., 2012).

Client and health care professional perspectives have been inadequately addressed and are worth exploring (Mohr, 2009; Morton et al., 2017). This may identify the barriers that deter or facilitators that encourage health care professionals to refer clients to using digital resources for pain management. For example, Morton et al. (2017) argue that health professionals may believe self-monitoring of pain through digital resources increases workload, time and energy, aligning with other research (Lalloo et al., 2015). The present study’s findings support this and contribute to the existing literature by expressing the problems of self-monitoring, such as enhancing focus on physical pain to result in detracting from self-management principles. As such, health professionals may require explicit guidance on how to best deliver this support and encouragement of digital resource use for their clients to provide appropriate and tailored resources to meet individual needs (Morton et al., 2017).

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Appendix A

Participation Information Sheet

**PARTICIPATION INFORMATION SHEET**

PROJECT TITLE: Facilitators and barriers of patient self-management digital tools for chronic pain: psychologists' perspectives.

HUMAN RESEARCH ETHICS COMMITTEE APPROVAL NUMBER: 18/32

PRINCIPAL INVESTIGATOR: Professor Anna Chur-Hansen

STUDENT RESEARCHER: Kate McKinlay

STUDENT'S DEGREE: Honours in Psychology

You are invited to participate in the research project described below.

What is the project about?

This research project is about psychologists' perceptions of the facilitators and barriers for the use of digital and online self-management tools (i.e., apps, websites etc.) by patients who live with chronic pain. We would like you to do an interview that will take between 45-60 minutes. As part of the interview, you will be asked your understanding of self-management for chronic pain, what are the major facilitators and barriers towards the use of digital self-management tools - and how these could be improved, along with any recommendations for future design and development. The purpose of this study is to identify aids or challenges from a specialised psychological perspective that may inform effective, appropriate and widespread tools for use by patients living with chronic pain.

Who is undertaking the project?

This project is being conducted by Professor Anna Chur-Hansen, Professor Paul Rolan, and Kate McKinlay (student researcher). The interviews will be conducted by the student researcher. This research is part of the requirements of a research thesis for the degree of Honours in Psychology at the University of Adelaide under the supervision of Anna Chur-Hansen and Paul Rolan.

Why am I being invited to participate?

You are invited as you are a psychologist with experience in treating and working with people with chronic pain.

What am I being invited to do?

You are being invited to attend a single one-on-one interview either face-to-face in Adelaide, or via telephone, Zoom or Skype, that explores your perspectives regarding the aids and challenges towards patients with chronic pain using digital and online self-management tools. With your permission, the interview will be audio-recorded. If face-to-face, the interview will take place at a public location of your choice in Adelaide, at your private office, or in a private room in the School of Psychology at the University of Adelaide.

How much time will my involvement in the project take?

You will be asked to take part in a single one-on-one interview with the student researcher that will take approximately 45-60 minutes. There will be no direct or indirect financial benefit, participation is completely voluntary.

Are there any risks associated with participating in this project?

The study has no foreseeable risks and is unlikely to cause any harm or distress to you.

What are the potential benefits of the research project?

You will not gain a direct benefit. The findings will contribute to the minimal literature on the facilitators and barriers of digital self-management tools for chronic pain patients from a psychologist view point.

Can I withdraw from the project?

You can withdraw from the study at any time without explanation. We can withdraw your data anytime up until submission of the thesis (i.e., October 2018).

What will happen to my information?

Your interview will be audio-recorded and transcribed into a written interview. This will be un-identifiable with a number allocated to you, or pseudonym of your choice. The audio-recordings, notes and transcripts from the interviews will be accessed by the student researcher and her supervisor. You will be offered the opportunity to receive a copy of your final de-identified transcript within two weeks of your interview and request changes if you would like to. You will also be offered a summary of the research findings on completion of analysis. The findings may be included in a relevant journal paper, via media release through the University of Adelaide or conference paper. All audio recording, notes, and transcripts will be stored on a university password-protected computer. The student researcher will be the only individual accessing this. At the completion of the project, all files will be deleted from the computer and destroyed. A copy of the final transcripts will be stored on a USB at the School of Psychology at the University of Adelaide for a period of seven years, at which time they will be destroyed. If you are interested in the results of the project, we will send this to you.

Who do I contact if I have questions about the project?

If you have any questions, please contact Anna Chur-Hansen (anna.churhansen@adelaide.edu.au or (08) 8313 5738), Professor Paul Rolan (paul.rolan@adelaide.edu.au or (08) 8313 0599) or the student researcher (kate.mckinlay@student.adelaide.edu.au)

If I want to participate, what do I do?

If you wish to participate, please contact the student researcher to organise an interview (kate.mckinlay@student.adelaide.edu.au). Upon review of the consent form, you can email a signed copy to the student researcher. Alternatively, you can provide a signed consent form on arrival to the interview.

What if I have a complaint or any concerns?

The study has been approved by the Human Research Ethics Committee at the University of Adelaide (approval number H-2018-32). This research project will be conducted according to the NHMRC National Statement on Ethical Conduct in Human Research (2007). If you have

questions or problems associated with the practical aspects of your participation in the project, or wish to raise a concern or complaint about the project, then you should consult the Principal Investigator. If you wish to speak with an independent person regarding concerns or a complaint, the University's policy on research involving human participants, or your rights as a participant, please contact the Human Research Ethics Committee's Secretariat on:

Phone: +61 8 8313 6028

Email: hrec@adelaide.edu.au

Post: Level 4, Rundle Mall Plaza, 50 Rundle Mall, ADELAIDE SA 5000

Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

Yours sincerely,

Professor Anna Chur-Hansen

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(08) 8313 5738

Professor Paul Rolan

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Kate McKinlay - Student Researcher

kate.mckinlay@student.adelaide.edu.au

Appendix B

Interview Guide

Main prompt questions

- Can you please tell me about your clinical experience working in chronic pain, as a psychologist? (For how long, context?)
- What do you think is the current best practice for the management of chronic pain?
- What kind of things do you do in your practice for clients with chronic pain?
- What kinds of things do you think people with chronic pain are doing outside of your consults to manage their pain (problems?)
- What are your thoughts about clients with chronic pain going online as a form of pain management?
- What kinds of online resources have you recommended to your clients?
- How do you think online resources may help improve someone's pain?
- Can you see any reasons for clients to be more likely to use an online resource for their pain?
- Can you see any reasons for clients to be less likely to use an online resource for their pain? (Challenges? What factors might deter a client?)
- Are you aware of any online resources that have been developed or lead by patients? (Do you think it is necessary if they are involved in the development? Patients role?)
- What do you think is the most important content to be included in an online resource for pain management?
- Is there anything else you would like to add to this conversation or ask me?

Additional questions

- Have you received any feedback from clients following use of online resources? (Have they been useful?)
- How might you help someone with chronic pain engage in an online resource?
- Can you tell me of any benefits or disadvantages there might be of clients going online for pain management?
- What are your thoughts of online social support for those with chronic pain?
- What are your thoughts on monitoring and tracking pain and other factors influencing pain? (Is self-management important?)
- What do you think online resources should look like for clients to manage their chronic pain appropriately?