



Topical Review

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Pain management programmes via video conferencing: a rapid review

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Abstract

Objectives: During the current COVID-19 pandemic, healthcare has been transformed by the rapid switch from in person care to use of remote consulting, including video conferencing technology. Whilst much has been published on *one-to-one* video consultations, little literature exists on use of this technology to facilitate group interventions. Group pain management programmes are a core treatment provided by many pain services. This rapid review aimed to identify the extent of use of video conferencing technology for delivery of group pain management programmes and provide an overview of its use.

Methods: A rapid review of the literature published up to April 2020 (PubMed, PsycINFO and PEDro) was performed. The search string consisted of three domains: pain/CP (MeSH term) AND Peer group[MeSH] AND Videoconferencing[MeSH]/Telemedicine[MeSH]/Remote Consultation [MeSH]. The studies were of poor methodological quality and study design, and interventions and chronic pain conditions were varied.

Results: Literature searching yielded three eligible papers for this review. All studies had low methodological quality and risk of bias. Heterogeneity and variability in outcome reporting did not allow any pooling of data. The results demonstrated that videoconferencing for delivery of group programmes is possible, yet there is little extant literature

on how to develop, deliver and measure outcomes of such programmes.

Conclusions: This review demonstrates that there is little evidence to support or guide the use of synchronous videoconferencing to deliver pain management programmes. We present issues to consider, informed by this review and our experience, when implementing video conferencing. Study quality of existing work is variable, and extensive future research is necessary.

Keywords: chronic pain; tele health; pain management programme; video conferencing.

Introduction

Pain services have had to adapt rapidly during the COVID-19 pandemic. Widespread restrictions such as social distancing and shielding for vulnerable people have led to many appointments being rescheduled or cancelled. People often experience long waits to be seen in pain services. The current restrictions are likely to compound this, increasing distress and pain [1]. People with pain have expressed a desire to have the choice to access services remotely during COVID, and for remote consultation opportunities to continue after this pandemic [2].

Pain services have moved to rapidly implement telehealth solutions, largely via telephone, and increasingly using Video Conferencing (VC), predominantly for one-to-one or multidisciplinary assessments [3, 4]. Relaxation of regulatory frameworks around information governance [5], and increased software availability, has facilitated rapid implementation. Some pain services have adopted VC, using various platforms e.g. Attend Anywhere™ or Zoom™. Uptake varies and is not universal [2, 6].

Pain management often employs a group approach via pain management programmes (PMP). PMPs are delivered by a multidisciplinary team of healthcare professionals (HCP) and aim to improve participant wellbeing and functioning [7]. PMPs have demonstrated low to medium effect size on disability, mood and catastrophic thinking [8] but variability in content, delivery mode, dose and staffing

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exist [9]. Guidance for the resumption of pain services has highlighted that running PMPs will pose particular challenges related to treatments provided by more than one professional and in a group setting [6].

Previously VC has been explored as an alternative to in-person clinical encounters with interest related to implementation, accessibility and efficacy particularly in one-to-one appointments. Evidence is growing in different clinical settings e.g. primary care, heart failure and diabetes [10–12]. Limited physical examinations using VC are feasible, with recent work conducted in heart failure, though there are additional considerations such as ensuring clear instructions, and family or carer support [11]. VC is safe, effective, convenient and acceptable to patients and staff [10]. However, clinicians may opt out for practical, technical or clinical reasons [13].

The use of VC in the delivery of group PMPs has not been discussed in the literature with most guidance referencing self-directed web-based resources rather than synchronous VC (e.g. [1, 14]). Minimal guidance exists on practical aspects of clinical delivery, software choice or efficacy. Currently, no published guidance exists on providing group-based PMP using VC that enables interaction between group participants and HCPs.

The findings of this review will be relevant to providers working in pain services, and those who struggle to access pain services, who are considering, or have started using VC.

Aim

To provide an overview of VC group PMP use by considering the question: *Can PMP group interventions be delivered via Video Consultation (VC)?*

Secondary aims are to review current delivery methods for VC PMPs, consider effectiveness and provide recommendations regarding implementation and evaluation.

Methods

We followed principles of review registration using the PROSPERO template. We searched the PROSPERO database for any registered reviews of pain management programmes or groups via VC but none was identified. To align with principles of open and transparent research, we attempted to pre-register this rapid review; however, no suitable registration platform for rapid reviews was identified.

A literature search of studies published to April 2020 was performed (NWR, Outreach Librarian, Bodleian Health Care Libraries, Oxford university). Due to the limited nature of rapid

review methodology and with advice from the outreach librarian and peer review, we chose PubMed, PsychINFO and PEDro databases as most likely to yield relevant publications. To widen the result field, we chose not to limit to randomized controlled trials. We additionally carried out a search using Google scholar with the same search terms modified to optimize Google's search parameters e.g. dropping Boolean operators. The search strategy and draft manuscript were peer reviewed and reviewer comments used to further refine the methodology.

Included studies

- Sampled people with chronic pain
- Used any form of synchronous video consultation software
- Were published in English in peer-reviewed journals
- Identified at least one healthcare professional involved with the group delivery
- No other limits were applied

The search string consisted of three domains: pain/CP (MeSH term) AND Peer group[MeSH] AND Videoconferencing[MeSH]/Telemedicine [MeSH]/Remote Consultation[MeSH]. The search strategy is detailed in Appendix i.

Results

Six hundred eighty-five articles were identified following the initial search. Following screening by an information specialist, we identified 97 abstracts. Using a two-step process, JW and DD initially independently reviewed the titles and abstracts. Following this, we compared, accepted, rejected and undecided papers. Discrepancies were discussed considering whether the abstract met our inclusion criteria and we eliminated 91 papers. We obtained full-text articles of the remaining six papers. Both authors then independently reviewed full papers and eliminated a further three studies following further discussion. Both authors then extracted data from the three papers against AMSTAR criteria. JW, JB and DD then contributed to the descriptive synthesis done collaboratively using a shared document on GoogleDocs. See Appendix ii for an amended PRISMA flow diagram of search results. Descriptive information regarding identified studies is summarized in Table 1.

Quality assessment

The three papers we included did not follow conventional research methods as all adopted service evaluation and quality improvement approaches. Only one paper [15] presented outcome data on effectiveness but did not

Table 1: Summary of included studies.

Author (Year) Population (n)	Intervention	Profession	Software platform	Attrition & adverse events	Comments on VC	Outcome measures
Gardner (2008) CP patients referred for MBPM (n=215)	MBPM classes comprised 10–20 pa- tients meeting simulta- neously at two different sites (one with therapist present), based at their local hospitals. Classes met for 2 h per week over a period of 10 weeks.	MBPM instructor. Profession not stated.	Ontario Telemedi- cine Network. IP transmission 384 kbit/s.	Dropout rate 33%	VC is an effective mode of delivery for the mindfulness course and may represent a new way of helping chronic pain patients in rural areas.	Short- form 36 (SF-36v2) Pain NRS
Glynn (2020) U.S. military veter- ans with CP, primar- ily white; 81.7%, and male; 88.1%. (n=126)	Clinical services were typically offered in a hybrid format. Mixed VC and in person treat- ments. Four 120 min classes; pain education classes, CBT groups, opioid safety education, and acupuncture edu- cation (therapist deliv- ering remotely). 60 min in-person appointment with therapist.	MDT (psychologist, anaesthesiologist, physician, physical therapist, psychol- ogy trainees, nurse practitioners, pharmacists, and registered nurses)	Codec, computer, and monitor were needed to provide telehealth. Software platform not stated.	Not reported.	Time is required to build new telehealth infrastructure.	None reported
Palyo (2012) U.S. military veter- ans with CP for whom medical in- terventions have not worked. Co- occurring mood dis- orders. (n not stated)	Mixed in person and VC groups. 10 patients in person with therapist and 4 via VC. No detail of structure r format of classes provided.	Psychologist and physical therapist.	Tandberg video teleconference system.	“Attrition rates are similar for onsite versus remote-site patients”	Dropped connections and delayed audio or visual feed can disrupt treatment.	None reported

CBT, cognitive behavioural therapy; CP, chronic pain; MBPM, mindfulness-based pain management; NRS, numerical rating scale; VC, video consultation.

specify study design or follow methodological or reporting conventions for any specific trial design.

Palyo and colleagues [16] have published a short two-page report with limited description of the interventions and no reported outcomes. As such, the robustness of their conclusions and recommendations are debatable. Glynn and colleagues [17] describe the implementation of a VC service using Quality Improvement methodology (QI) but did not report on any outcomes.

Given the variable study designs and reporting of these three papers, it was not possible to pool results and compare findings. We therefore describe the main reported findings from each paper, commenting on limitations, before drawing out key discussion points and making our recommendations.

Tele-pain management: use of videoconferencing technology in the delivery of an integrated cognitive-behavioural and physical therapy group intervention [16]

This paper describes the implementation of VC in an “integrated 10-week cognitive-behavioural and physical therapy group” co-led by a psychologist (who had received 4.5 h training for safe use of telehealth) and a physical therapist. Veterans with chronic pain and comorbid mood disorders who were receiving their routine care at community-based outpatient clinics were offered tele-pain management. The authors note that no participants declined participation due to issues with the technology. Instead, they reported declining due to financial, transportation, scheduling and “aversion to group treatment”.

At the time of writing their paper, the option of VC at home was not available as the technology was not yet readily available. The group programme required participants to travel to a clinic location where appropriate proprietary technology was available to video conference with the main hospital site. They did not report on treatment outcomes. As such it is not possible to compare efficacy with face-to-face group interventions. The authors do report that participants appeared to have group cohesion at both sites and felt like participants rather than observers. They conclude that the addition of video to remote consultations was essential in enabling the instruction of movement by the physical therapist.

Bringing chronic pain care to rural veterans: a telehealth pilot programme description [17]

Glynn et al. also describe the implementation of VC as part of providing telehealth services to veterans in the USA using a blended VC and in-person approach. The VC component was delivered via a hybrid model where patients were seen in person at a single hub site or attended via VC at four spoke clinics (2 urban, 2 rural). The interventions delivered via VC included four 120-min large group pain education sessions, eight 90 min pain psychotherapy groups; acupuncture education classes and opioid education classes co delivered by interdisciplinary clinicians. They also mention using telehealth to screen for participation in the functional restoration programme, but no further detail is provided. This paper reports that there was a significant amount of investment in the technological infrastructure to enable VC delivery using this model in addition to additional training required by some of the clinical staff. Though the authors do not report on clinical outcome data, they found that the subset of patients who received telehealth interventions were similar to VA patients accessing in-person care in terms of demographics and comorbidities.

Evaluating distance education of a mindfulness-based meditation programme for chronic pain management [15]

This paper reports the findings of a mindfulness-based pain management (MBPM) group delivered either in-person at the present site or via VC at a distant site (local hospital sites) in Canada. The programme was delivered for 2 h once a week for 10 weeks at similar time periods across all sites. The authors present data on 215 participants, of whom 99 attended the group in-person, 57 received the same intervention via VC at distant sites and 59 were included as the waiting list control group. Patient-reported

outcome measures (PROM) (see Table 1) were collected pre and post intervention.

Participants were not randomized, there was a big variation in numbers included in the groups and missing data was excluded from the final analysis. All of this could lead to bias and therefore results should be interpreted with caution. Both *in-person* and VC groups demonstrated lower usual pain scores for pain post intervention compared to the waitlist control group. They reported equivalent benefits between *in-person* and VC delivery when compared to the control group for quality of life (SF 36).

Physical component scores did not change for VC participants. VC group had a lower physical component score at baseline, perhaps indicating a preference for participants with lower physical ability to access services via VC. The authors suggest greater travel and parking issues as potential reasons. The authors state that improvements in catastrophizing are not hindered by VC delivery of treatment intervention. They reported higher attrition rates for *in-person* (49%) when compared to VC group (30%) and control group (10%).

Discussion

There has been rapid uptake of VC during COVID-19 within healthcare. Tolerance thresholds for VC appear to have been reduced where the alternative means waiting for normal *in person* services to resume, with considerable uncertainty related to timescales [2, 18].

Before COVID-19, pain service ability to offer VC involved a complex set of administrative processes to address the safety, legal, ethical, technical and logistical nuances of VC delivery [17]. Presently, many of these processes have been waived and many healthcare professionals are already providing services using VC [19].

We highlight some areas for consideration when implementing VC to deliver pain rehabilitation in groups remotely.

Participant considerations

Inclusion

VC delivered PMPs may be easier to engage with for those who might otherwise have an aversion to group treatment. VC also enables clinicians to see people in their home

environment and use that contextual knowledge to modify instructions in real time. VC delivered group programmes may encourage social connection, where many participants were already isolated and socially disconnected before COVID-19. Connections made possible during VC PMP programmes can extend beyond the sessions as well, promoting peer support.

Access

Accessing pain services can present a challenge, especially for those who are socially marginalized. Barriers can range from poor availability of services, inaccessible locations and mobility concerns, to lack of translators, fear of discrimination and limited financial resources [20]. Hub and spoke service models may offer a solution to location and access barriers. Synchronous VC can address service gaps in areas where people do not have access or have to travel long distances to access services. This can be problematic for people with mobility issues and where the costs involved are unaffordable. VC has the potential to reduce health inequities related to transportation, caring responsibilities and mobility issues. However, this is only the case where patients have access to (and can afford) reliable hardware, software and the required levels of Internet access [21]. Services will need to consider how to provide language interpreters and meet other accessibility requirements (e.g. hearing loop).

Participation

Patients, who had previously been identified as ineligible for *in-person* programmes, have reported that they would be willing to attend groups via VC. We have observed the ability for some to participate in VC groups where anxiety precluded them from *in person* group work. Participants who may not contribute vocally *in person* have been able to contribute through use of group chat function.

Attrition

Limited data presented here suggests attrition is lower for services delivered using VC compared to *in-person* [15, 17]. Self-directed web-based pain management programmes have been reported to have higher attrition rates than *in person* programmes [22]. Participants may struggle with motivation to work independently through material that may focus attention to pain. Peer support and social connection available via VC may be a factor in encouraging engagement.

Adverse events

No adverse events were identified in this review. However, psychological, environmental and wider health risks are important to consider when offering online VC PMP groups. Clear guidance on exercise is also recommended. Explicit plans to address identified risks that may occur during VC provide additional reassurance.

Service considerations

Infrastructure

Considerable investment in programme adaptation including converting audio-visual resources, setting up billing systems (if applicable) and retrofitting clinical environments with camera, audio and Internet, may be required for VC delivery.

Privacy, security and information governance should be considered when identifying a suitable VC platform. There now exists a wide range of specialist and commercially available platforms. The included studies used bespoke software platforms to deliver VC.

Connectivity issues such as dropped calls and delayed audio can be problematic [16]. Contingency plans including tech support, use of alternatives e.g. phone on loudspeaker, phone follow ups should be agreed (*ibid*).

Clinician training and confidence

Staff training on the safe use of tele-health technology in important including identifying suitable candidates and conducting risk assessments [4, 15–17].

High levels of anxiety have been reported amongst clinicians regarding the rapid switch to online service delivery [6]. Some issues clinicians have experienced include not being familiar with software, concerns about effectiveness, and adapting style to online delivery are [4]. No published data related to the role of clinician confidence with VC on outcomes for PMPs exists at present.

Evaluation

Ability to complete online Patient Reported Outcome Measures (PROM) will facilitate VC evaluation and reduce unnecessary loss of data. This requires adequately resourced personnel to support collection.

Comparison with other reviews

We identified no other reviews on group PMPs that include synchronous VC. Literature related to online or web-based PMPs that explore self-directed online resources, sometimes coupled with individual appointments or text contact with healthcare professionals has been published [22–24].

VC has been used successfully in group programmes for long-term conditions. A systematic review exploring health professional led group VC to provide education and/or social support in a home setting reported that (1) groups delivered via VC were feasible including for people with limited digital literacy; (2) acceptability was high and people valued access from home; (3) participants had low concerns about privacy; (4) implementation required good training for staff and participants; and (5) outcomes were similar for VC groups and face to face groups [25]. Though none of the papers included pain, similar interventions are used in pain management services e.g. education, cognitive behavioural therapy.

Research implications

The limited number of low-quality papers included in this review means we cannot comment on effectiveness of VC delivered PMPs.

Minimal research is currently published on VC PMPs because they were pragmatically developed and implemented rapidly during the pandemic. This affords the opportunity for lessons learned from on-site telehealth groups like those presented in this rapid review, as well as insights from those who have implemented group PMPs via VC, to inform a robust research agenda.

No studies were identified for this review on in-home participation in VC group PMPs. It is important to study PMPs that are delivered to patients' personal electronic devices and preferred locations, such as in their homes or places of work.

Future research will need to determine the feasibility, acceptability, security concerns and accessibility of such programmes. Assessing Internet availability and identifying ways to remedy lack of access, sufficient bandwidth and associated costs is important. Training programmes for both clinicians and patients to improve confidence, address concerns and increase proficiency may be helpful. Determining best practices for the development and implementation of PMPs in a virtual environment seems to be a priority. Such programmes should be co-created with patient partners and members of the community who these programmes are designed for. Research into VC PMPs can

build on programmes that have been initiated out of necessity, formalising relevant research questions to answer, designing programmes, implementing them and studying appropriate outcomes.

Synchronous VC has been used in education for both groups and individual learners in formats that also include practical observations e.g. learning the piano [26] and physical education assessments [27]. Involving learners in “cogenerating” some of their own learning in synchronous virtual environments fosters the development of personal connections and improves engagement [28]. This idea has parallels with the role of peer support in pain management programmes and merits further research.

Strengths and limitations of this review

An overview of existing literature in this area, including robust search strategy and methodology, is presented.

- We included a patient partner with lived experience of pain in conducting this review. Partnering with patients has become a priority for international bodies such as the International Association for the Study of Pain, as evidenced by their establishment of the Global Alliance of Pain Patients Advocates Presidential Task Force.
- Recommendations for clinical and research priorities are presented.
- The nature of our rapid review methodology means some relevant papers may have been excluded e.g. non-English language and those published in nonpeer-reviewed journals.
- We were unable to register our protocol.
- The lack of outcome data means we are unable to undertake evaluation of efficacy.
- We did not seek out policy-makers and decision-makers views.
- No grey literature or supplemental searching was included.

Conclusion

Telehealth has been proposed as one solution to more equitably distribute speciality pain resources that tend to be concentrated at large urban medical centres. The current COVID-19 pandemic has presented a unique opportunity for pain services to adapt and offer VC PMPs in addition to existing *in person* options. Little research exists to guide development of such programmes. VC represents a new way of helping people living with pain who may

otherwise experience difficulties accessing specialist pain services.

Systems to capture clinical outcomes and other aspects of this new method of service delivery are needed. Staff support and training is also important. Ultimately, bringing PMPs into patients' homes provides a unique opportunity to offer person-centred alternatives for people living with pain who face barriers to *in-person* treatment and may be socially isolated. Improved access that may be afforded by adopting VC offers opportunities to improve therapeutic relationships, provide necessary support and connection, potentially making care more efficient in terms of access, time and cost.

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Author contributions: All authors have accepted responsibility for the entire content of this manuscript and approved its submission.

Conflict of interest: There are no declarations of conflict of interest.

Informed consent: No human participants were included in this work.

Ethical approval: This was a review of the literature and did not require ethical approval.

Appendix i

Search strategy for PubMed

((pain*[Title/Abstract]) OR ("Pain Management"[Mesh] OR "Pain"[Mesh])) AND ((meeting*[Text Word] OR support group*[Text Word] OR "peer support"[Text Word] OR peer counsel*[Text Word] OR peer therap*[Text Word] OR group counsel*[Text Word] OR group therap*[Text Word] OR group psychotherap*[Text Word]) OR ("Self-Help Groups"[Mesh] OR "Peer Group"[Mesh] OR "Group Processes"[Mesh:NoExp])) AND (((online[Title] OR tele*[Title] OR electronic[Title] OR web*[Title] OR internet[Title] OR digital*[Title]) OR (telem*[Title/Abstract] OR telemed*[Title/Abstract] OR telehealth[Title/Abstract] OR telehealth[Title/Abstract] OR telerehab*[Title/Abstract] OR

tele-rehab*[Title/Abstract] OR mhealth[Title/Abstract] OR ehealth[Title/Abstract] OR "mobile health"[Title/Abstract])) OR (remote consult*[Title/Abstract] OR digital consult*[Title/Abstract] OR remote counsel*[Title/Abstract] OR digital counsel*[Title/Abstract] OR video*[Title/Abstract] OR skype[Title/Abstract] OR zoom[Title/Abstract] OR houseparty[Title/Abstract] OR google hangout*[Title/Abstract] OR facebook[Title/Abstract])) OR ("Videoconferencing"[Mesh] OR "Telemedicine"[Mesh] OR "Remote Consultation"[Mesh]))

Search strategy for PsychINFO

1. pain management/or exp pain/or exp pain perception/
2. pain.ti,ab,hw.
3. 1 or 2
4. exp support groups/or group counseling/or exp group psychotherapy/or exp self-help techniques/or social networks/or social support/
5. (((support* or peer or counsel* or therap* or psychotherap* adj3 group*) or peer support).ti,ab,hw.
6. 4 or 5
7. video-based interventions/or videoconferencing/
8. exp telemedicine/
9. ((remote or digital* or online or web* or internet or video*) adj3 (group* or meeting* or consult* or support or service*).ti,ab,hw. or (online or digital* or web* or electronic* or technolog*).ti. or (telehealth or tele-health or telemed* or tele-med* or telerehab* or tele-rehab* or mhealth or mobile health or ehealth).ti,ab,hw.
10. 7 or 8 or 9
11. 3 and 6 and 10
12. ((video* adj3 (conference* or consult* or meeting* or support or group*)) or skype or zoom or google hangout* or facebook).ti,ab,hw. or video*.ti.
13. 3 and 12
14. 11 or 13
15. 6 and 10
16. limit 15 to "reviews (maximizes specificity)"
17. 14 or 16
18. limit 17 to (english language and yr="2000-Current")

Search strategy for PEDro:

Title/Abstract=video* AND Topic=Pain

Title/Abstract=Skype AND Topic=Pain

Title/Abstract=zoom AND Topic=Pain

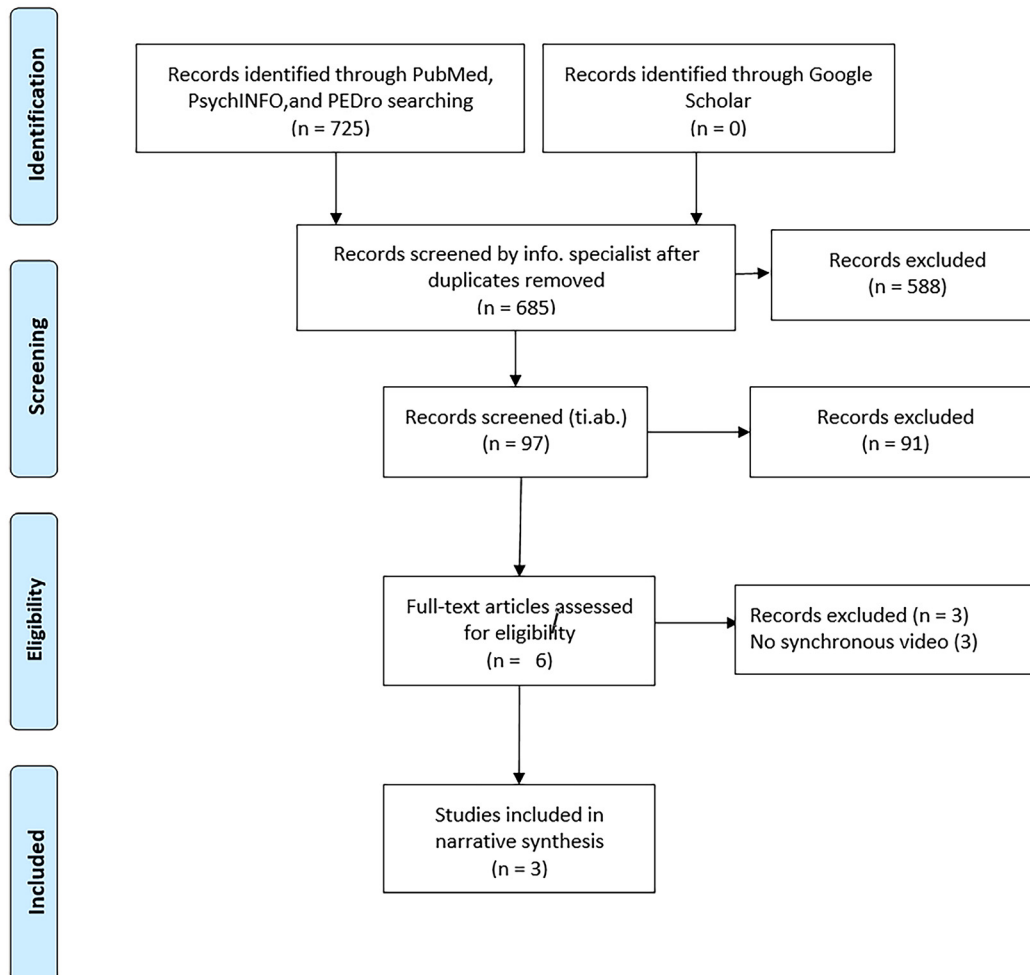
Title/Abstract=google hangouts AND Topic=Pain

Title/Abstract=facebook AND Topic=Pain

Appendix ii



PRISMA Flow Diagram for Pain Management Programmes via Video Conferencing: a rapid review



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