

# INTEGRATING TELEPSYCHIATRY BASED CARE IN RURAL ACUTE COMMUNITY MENTAL HEALTH SERVICES? A SYSTEMATIC LITERATURE REVIEW

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## ABSTRACT

### BACKGROUND:

There is limited local literature specific to emergency department assessment and subsequent telepsychiatry follow up in the community and most literature on telepsychiatry does not cover the case of urgent assessment and crisis follow up in the community.

### AIM:

This literature review explores the use of videoconferencing technology to overcome the burden of distance and access to tertiary mental health services in regional and remote areas of Australia.

### METHODS:

A systematic search in Medline, CINAHL, Psychiatry Online, Google Scholar, and the NSW Health Clinical Info Access Program (CIAP) was conducted. A combination of key terms: "Telepsychiatry" OR "Mental Health Telemedicine" OR "Telemedicine" OR "Telehealth" OR "Videoconferencing" OR "Mental Health Videoconferencing" OR "Telepsychiatry Ethics" AND "Acute Community" AND "Emergency Assessment" were used. Based on the screening and eligibility criteria, 21 peer-reviewed articles published in English between 2005 and 2020 were included in the review.

### RESULTS:

Key themes were found which support the use of remote telepsychiatry. Common in the literature were themes of equivalence to in-person review, as well as themes of convenience, overcoming remoteness and timely access to specialist assessment. Ethical and technical considerations was also commonly cited. The literature search found no direct examples of an acute psychiatric assessment in the emergency department with a subsequent follow-up in the community using videoconferencing technology.

### CONCLUSION:

Telepsychiatry in both the home and emergency department areas had merit and equivalence to face to face review, with the added benefit of wider access and timeliness to specialist assessment and treatment.

### KEYWORDS

Telepsychiatry, Mental health, Rural, Videoconferencing

## INTRODUCTION

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It is frequently cited that living in rural and remote areas is a contributing factor to poor health outcomes. The causes of this are multiple, despite higher rates of hospital admissions, health outcomes are poorer and access to basic primary care is limited compared to metropolitan areas. Social determinants of health such as education level, income and employment are also poor, compared to metropolitan Australia [1]. Other barriers to health care are logistical, lacking a critical population mass, access to specialty services and specialists is limited. Geographical barriers limit access to specialties worsened by poor public transport. For those suffering from mental health concerns these barriers are enhanced through the symptoms of mental illness, stigma and inability to seek help [2].

This literature review will explore the use of videoconferencing technology to overcome the burden of distance and access to tertiary mental health services in regional and remote areas of Australia. New technology and methods of communication, can be unfamiliar and challenging especially where such change moves ahead of established professional culture, ethics and practices [3]. Videoconferencing or telepsychiatry is an emerging technology which influences practice and can be fully integrated into contemporary rural health services. There is also emerging evidence that telepsychiatry can treat higher risk consumers with severe and enduring mental illness in the community [4,5].

During initial scoping for this topic, it was found that there is some localised use of telepsychiatry in remote emergency departments (ED) in NSW for initial psychiatric assessment and planning [6,7]. As an extension of this, is the concept of having an integrated telepsychiatry service where timely specialist emergency assessment can be accessed in more remote or regional areas where there is not 24-hour cover. After this initial assessment, follow up in the community using the same or similar technology to compliment current treatment services.

On an initial scoping review, it was found that there was limited local literature specific to emergency department assessment and subsequent telepsychiatry follow up in the community and most literature on telepsychiatry does not cover the case of urgent assessment and crisis follow up in the community [8]. This is an important topic, as technology improves in everyday communication, it is important to

then seize those opportunities to improve access for mental health care [9]. Therefore, the question informing this literature review, is specialist mental health videoconferencing within the home and emergency department a viable and practical alternative to current practises in rural acute community mental health services?

Although the literature in this review predates the beginning of the COVID-19 public health crisis. In the first quarter of 2020, there has been a rapid escalation in planning and activity in countries which are affected by the virus and having to adapt to conditions where direct patient contact is substantially restricted. Consequently, health services must provide alternatives, including the implementation of home videoconferencing consultations [10]. This is in addition to the expected burden on mental health services through trauma and isolation and vicarious or direct trauma of staff [10]. Enhancements to assertive community support via telehealth have already been implemented by Australian Government bodies, through Medicare, Non-government funding and state government funding [11,12]. This adds to the importance of understanding this subject to prevent iatrogenic harm through unplanned implementation.

There is varied terminology in the literature that is synonymous, that is, the same concept in terms of purpose and technology but it is useful to set them out for clarity, although there is no broad agreement on terms. For this literature review the term 'telepsychiatry' will describe the interaction between a clinician and a consumer via a remote video internet-based system [13]. This interface can be centre based, where the consumer is on campus, such as an emergency department and home based telepsychiatry is where the consumer is at home and the clinician is on campus or elsewhere [14].

## METHODS

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This study was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines.

## SEARCH STRATEGY

A search was undertaken of the major literature search data bases including Medline, Cumulative index of nursing and allied health literature (CINAHL), Psychiatry online, Google scholar, and the NSW health Clinical Info Access Program (CIAP). The Cochrane library for systematic reviews was also searched for recent systematic reviews,

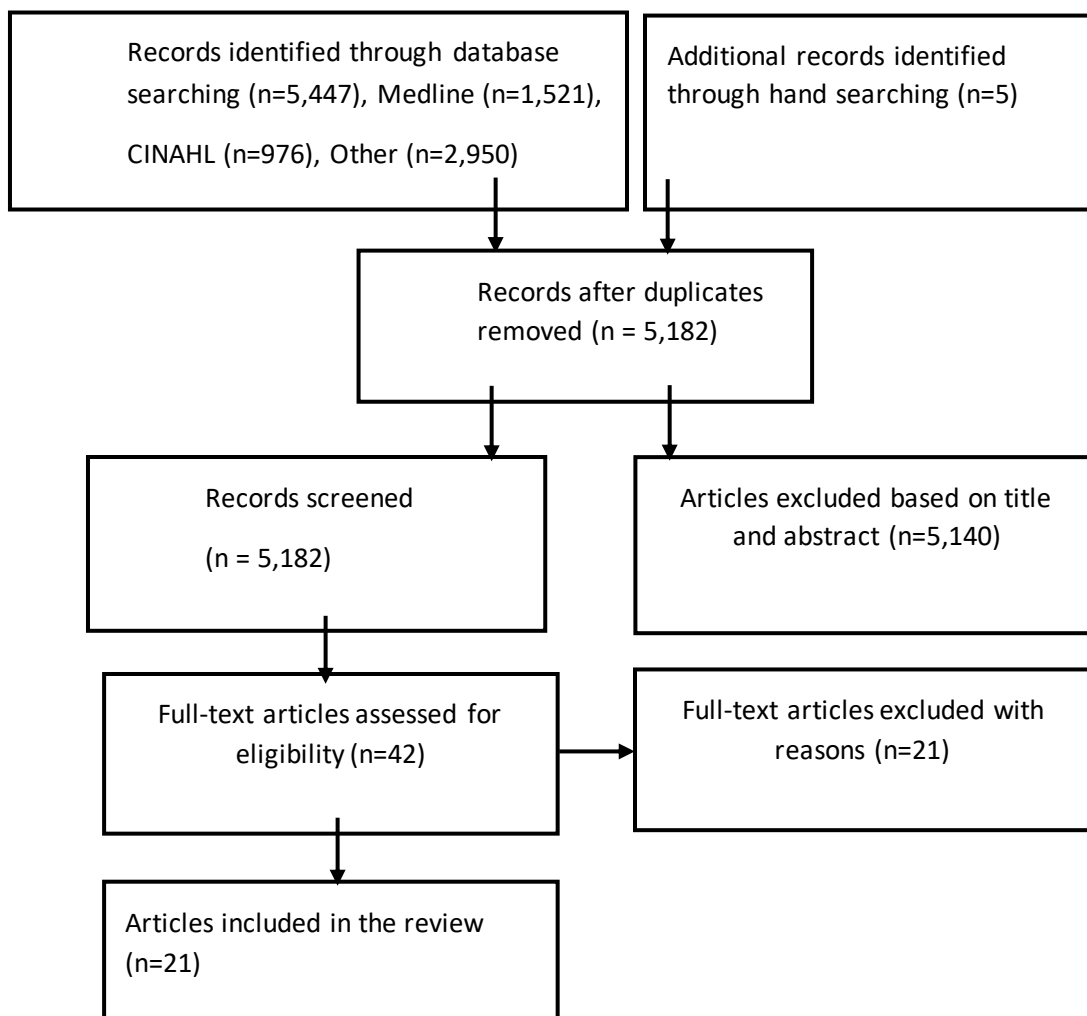
these reviews were harvested for original research relevant to the topic.

relevant studies not captured in the Medline and CINAHL by using the same terminologies.

Given the varied nomenclature to describe similar videoconferencing technology, several search terms were placed in quotation marks, including: telepsychiatry OR mental health telemedicine OR telemedicine OR telehealth OR videoconferencing OR mental health videoconferencing OR telepsychiatry ethics AND acute community AND emergency assessment. In addition, Boolean operators were used in combination with the above base search terms. A search in Google scholar was conducted in addition to a manual hand search of the reference lists of the included studies to identify additional

The search resulted in a high yield of non-mental health material and telehealth which did not use live video, which was excluded. Non-English articles were excluded. The search was limited to retrieve articles published between 2010 to 2020 only. However, given the limited results directly related to the area of interest, a further search was undertaken back to 2005, although this did not yield any suitable results. All the articles used for background and tentatively included in the literature review had their reference lists searched, which was effective and yielded more original research. See Figure 1 for PRISMA search strategy.

**FIGURE 1: PRISMA FLOW DIAGRAM OF INCLUDED STUDIES**



## SEARCH OUTCOMES

Figure 1 summarises PRISMA search strategy. A total of 5452 records were identified. Out of the total records, 330 duplicates were removed. The title and abstract of the remaining records were then screened (n=5182) and 5140 studies excluded after applying eligibility criteria. Forty-two

full-text studies were then obtained to be further assessed for eligibility. An additional twenty-one studies which did not support the use of remote telepsychiatry were excluded after the full-text screening. Twenty-one studies were identified and included in the final synthesis.

## DATA EXTRACTION

The extraction form was developed using Joanna Briggs Institute and Cochrane manuals. This form was created to document consistent data from each of the articles. Based on the individual study findings, a coding framework was developed to identify common themes among the selected studies. A mixed-methods synthesis approach was developed aggregating findings to summarise both quantitative and qualitative data. There was sufficient original material on the topic of home based telepsychiatry and emergency based telepsychiatry, although not exactly matching the preferred phase of care in acute community home treatment. As a result, specialist intervention research via telepsychiatry were included which were similar in context and able to inform this review.

The data extraction form was grouped into three sections. The first section was related to the characteristics of the included studies such as the authors, year of publication and the country in which the study was conducted. The second section documented information related to the study methods and designs. The third section was related to the key findings of the studies. The first author extracted data from the included studies and the third author confirmed the extracted information.

## ETHICAL AND METHODOLOGICAL LIMITATIONS

Ethical approval was not sought for this literature review. A Human Research Ethics Committee (HREC) approval was not necessary, as this review only utilised previously collected data and published studies.

There are some inherent methodological limitations in this review. For instance, the present review did not include reports, grey literature and textbook which could provide additional information. In addition, this review included articles published in English language in the period 2005 to 2020 which could have missed some additional results.

## RESULTS

From the literature search, there were key themes found which support the use of remote telepsychiatry. Common in the literature were themes of equivalence to in-person review in addition to themes of convenience, overcoming remoteness and timely access to specialist assessment, even in more remote areas. Ethical and technical considerations was also commonly cited. These core themes and sub-themes were presented in the Table 1 and Table 2.

TABLE 2: THEMES AND SUB-THEMES

Themes	Sub-themes
Emergency department telepsychiatry is effective	<ul style="list-style-type: none"><li>urgent psychiatric assessment in emergency departments</li><li>a telepsychiatry option for paediatric emergency departments</li><li>reduced length of stay and reduced cost</li><li>the geographical challenges</li><li>immediate assessment by a specialist clinician</li></ul>
Home based telepsychiatry is less common but effective	<ul style="list-style-type: none"><li>home based telepsychiatry treatment method</li><li>low technological literacy, isolation, complexity, stigma and challenging behaviour preclude home based treatment by telepsychiatry</li><li>patients feel safer in their home environment</li></ul>
Ethical consideration in telepsychiatry	<ul style="list-style-type: none"><li>isolation and unsatisfactory access to the internet</li><li>ethical breaches through unsecure internet connections</li></ul>
Technical barriers and consideration for access	<ul style="list-style-type: none"><li>access to right equipment and bandwidth is a limiting factor in the use of telepsychiatry</li><li>technical factors around home base video conferencing</li><li>national broadband network (NBN) connections and mobile technology</li><li>impediment using proprietary software to access in urgent clinical situations</li></ul>

## EMERGENCY DEPARTMENT TELEPSYCHIATRY IS EFFECTIVE

In this review articles were selected which focussed on telepsychiatry used for urgent psychiatric assessment in emergency departments. Most of the quality peer reviewed literature was from the US and Norway with some Australian research based in NSW. Clinician and consumer perspectives were found and all age groups were included. In addition to general emergency areas, paediatric emergency departments were included and yielded research relevant to the aims of the literature review.

In a group of paediatric emergency departments in Denver, although metropolitan, did not have on site specialist mental health staff. Previously, children requiring psychiatric assessment were transported to a specialist centre. However, a telepsychiatry option was put in place. In this group, Thomas audited 494 psychiatric assessments where one group were assessed on site and the other were transported to the specialist facility. Key performance data was analysed related to disposition, cost, admission rate and readmission [15]. The telepsychiatry group rated better in all domains and in a consumer feedback survey also rated highly in consumer satisfaction. Also, in the paediatric emergency area, Reilford and Adebajo analysed the performance data of a New York children's hospital which commenced on site telepsychiatry assessment, instead of calling in specialist clinicians [16]. They found there was significant improvement in key performance data with reduced length of stay and reduced cost. However, where an admission was required, there was no difference in length of stay, also, in this study service user perspectives were not sought.

In a Norwegian study, Tronsden et al. conducted interviews with service users and staff to describe their experience with a rural urgent telepsychiatry assessment [17]. The service users and staff describe the geographical challenges of providing specialist urgent psychiatric assessment in semi-remote areas. They found there are four pragmatic drivers which are common to the success of remote telepsychiatry, that is, telepsychiatry allows for close to, immediate assessment by a specialist clinician.

Related to this is the work of Saurman et al. who found that the attitudes of staff towards emergency telepsychiatry was based on preconceived ideas and prejudices of video conferencing service to be inferior to a traditional interface

[6]. Acceptance of this was in two stages, firstly when a service gap was filled by the ED telepsychiatry service and second, when there was better awareness and familiarity with the service. Awareness in this context is understanding the service, how to access and facilitate access for consumers.

The largest research study found, conducted by Narasimhan et al. which compared 7261 telepsychiatry episodes in the emergency department with an equal number of encounters that did not use the telepsychiatry service [18]. The results from this study found clear advantages in the telepsychiatry group in terms of less cost, less wait time, fewer representations to the emergency department and improved post discharge engagement with follow up services. The authors also describe the drivers to the implementation of the telepsychiatry service, which are a lack of psychiatric specialists in rural areas and associated challenges in attracting staff to those areas.

This is comparable to an Australian context and outlined by Saurman et al. [7] who also document the same drivers as Narasimhan et al. [18]. Saurman et al. reviewed the non-admitted patient performance data for eight remote NSW health districts for a total of 1487 clinical services episodes [7]. However, the Australian study results were less clear for the telepsychiatry advantages compared to the other overseas studies. Remote NSW was found to be different in that there are remote regional hospitals and then a category of 'very' remote hospitals. The very remote centres had a higher rate of admission after a telepsychiatry assessment compared to usual practice.

## HOME BASED TELEPSYCHIATRY IS LESS COMMON BUT EFFECTIVE

Overall, there was little original research in the effectiveness of home based telepsychiatry in the acute stage of treatment and intervention, no Australian based studies were found. However, there are examples of home based telepsychiatry which focussed on specific psychiatric illnesses and populations [19]. The common thread in all the articles was the use of telepsychiatry in the home environment.

A collection of case studies by Hogan et al. explores five cases which used a home based telepsychiatry treatment method [20]. The five cases are presented as a counterpoint to perceived bias that telepsychiatry is unsuitable for certain psychiatric conditions or demographic. The authors provide examples that

challenge the perception that low technological literacy, isolation, complexity, stigma and challenging behaviour preclude home based treatment by telepsychiatry. Case studies can be useful to direct future study. However, some caution is required as most case studies are open to different interpretation with no methodological clarity [21].

In the search for original research in the application of home based telepsychiatry, one cohort was more prominent in the literature, which was veterans in the USA and treatment of trauma related illness. In the US, this is the most widely studied application of home based telepsychiatry [22]. Those suffering from trauma related illness tend to experience barriers to usual centre-based treatment through self-isolation, stigma, and living remotely [23]. In this randomised controlled trial, 52 participants were split into two groups, control and telehealth. Result was equally split between the two groups, both treatment mediums were equally effective. This research is further supported by Strachen et al. who enlisted a much larger cohort (n=227) for their randomised controlled trial which also found parity between the telepsychiatry and control group in effectiveness, with the addition of seeking qualitative feedback from consumers and concluded that widespread use of home based teleconferencing is inevitable as consumers "appear to like it, want it and more importantly, need it" (p. 408) [24].

A later randomised study by Gros et al. again to treat Post Traumatic Stress Disorder (PTSD) in a group of veterans [25]. This study also measured treatment response which also found no difference between home based telepsychiatry and centre-based treatment in terms of treatment response. This is also supported by Wagner et al. who had a similar result treating depression in terms of patient satisfaction and symptom improvement as equal to face to face treatment [26].

Outside of the US based trauma studies, a small Italian based study which describes and attempts to categorise videoconferencing in the psychotherapy treatment process. Cipolletta et al. seek to find if aspects of videoconferencing are disruptive to the therapy process, such as technical disruptions, environmental disruptions and privacy [27]. The sessions were recorded and then reviewed for content analysis. They found no disadvantage to home based videoconferencing treatment and in some clinical cases there were advantages in patients feeling safer in their own environment and in terms of convenience. The sample size in this analysis was small and

is useful as background but the authors did not rationalise how representative their sample is which would need further confirmation [28,29].

## ETHICAL CONSIDERATION IN TELEPSYCHIATRY

Within some of the chosen articles there was mention of ethical considerations in the research articles. Within the US based veteran telepsychiatry research, across that research resources and access to technology was not noted as an ethical concern as this was financially covered by the relevant repatriation funding body. Despite this, some participants had to be excluded due to isolation and unsatisfactory access to the internet [23]. Lai et al. noted concerns from participants around protection of privacy and recording of conversations [30]. Within emergency department based urgent telepsychiatry, there was discussion and mitigation of potential breaches of privacy through use of in house secure telemedicine systems or proprietary secure platforms [7,16].

Gamble et al. argue that with the increasing use of internet-based communication and its clear potential to extend the reach of service, with this, comes risk of ethical breaches through unsecure internet connections, from both clinician and service user [3]. Also, mitigating risk in terms of knowing the location of the service user if they engage in self harm or other risky behaviour, this is more difficult to mitigate in telepsychiatry [31].

Additionally, in the time of the current COVID-19 public health crisis there are other ethical considerations based on the principle that all public policy to manage infectious disease is a compromise between values such as privacy, liberty and protection of the public [32]. An example of this in the current crisis is where individual health districts within NSW have adopted less secure video conferencing platforms such as Zoom, to facilitate home based treatment.

## TECHNICAL BARRIERS AND CONSIDERATION FOR ACCESS

The technical aspect of access was split between the emergency department based and home based telepsychiatry systems. Emergency department based telepsychiatry, there is no requirement of the consumer to provide any equipment or bandwidth. Of the literature reviewed from an emergency department assessment perspective, services had put in place suitable, fit for purpose equipment. For example, Saurman et al. reported the equipment used was linked to the NSW

videoconferencing system which they note, was of a high standard [7]. In home based telepsychiatry, access to right equipment and bandwidth is a limiting factor in the use of telepsychiatry in addition to the inconsistent quality of commonly used videoconferencing tools such as Skype [3]. Within the US based veteran telepsychiatry this was less of a concern as equipment and software was provided in some studies [29].

The only original study included which explored the technical performance and satisfaction with videoconferencing was Taylor et al. which was Australian based research that explored technical factors around home base video conferencing, where consumer satisfaction and call dropout rate was measured [33]. The results were that fixed, national broadband network (NBN) connections were superior to mobile technology at the time and satisfaction levels were high. However, the research was conducted using proprietary software. This may be an impediment to access as in urgent clinical situations, the more commonly available software is more realistic and available in term of ready access [34,35].

## DISCUSSION

In addressing the question of the viability and practicality of creating an integrated telepsychiatry service which commences upon initial assessment in the emergency department and then continues onto treatment in the community, the findings of this literature review provide some confidence that this is a viable alternative to current service provision. This result is supported by relatively recent systematic reviews in the literature by Lawes-Wickwar et al. [5] and Reinhardt et al. [8] Assessments which are conducted by telepsychiatry in the emergency department were found to be equal to face to face assessment with the added advantage of providing specialist, timely assessment on site.

Evidence for home based telepsychiatry was less clear, with no true, home based telepsychiatry services found in the literature within Australia. Several overseas examples were found which were specialist services with specific treatments, such as treatment for PTSD, depression and first episode psychosis [24,30]. This does not directly answer the literature review question in comparative terms. However, there is enough evidence found in closely related work to support more broad use of home based telepsychiatry.

In assessing the evidence for the use of telepsychiatry, this literature review has found that telepsychiatry can be a potential solution to providing acute mental health care in more remote areas or as a means of concentrating more resources into a treatment episode. In terms of population health, the more resources that can be assigned to an individual, the better the outcome. However, this concentration of resources comes at the expense of treatment reach potential. Telepsychiatry is a means of overcoming this, both spreading and concentrating resources.

Alternatives to inpatient hospital care to assess and treat mental health conditions and situational crisis, at home, are long established and come under many different names which describe the same fundamental function [8]. Metropolitan Victoria have Crisis Assessment Teams (CAT) and other jurisdictions have various names for services with the similar functions. Common to these teams are the functions of initial triage, rapid assessment and short-term treatment in the home environment. These services usually operate in a multidisciplinary environment and work closely with primary care providers, such as general practitioners and other private or nongovernment providers [36,37]. Within the metropolitan setting this type of assessment is usually undertaken in person by a specialist mental health clinician based at the emergency department and staffed all hours [36]. Outside of the metropolitan area there is no consistent resourcing, some remote emergency departments are using on site telepsychiatry. However, this is not widespread and is a significant service gap [6].

## STRENGTH AND LIMITATIONS

The chosen research was from several different countries giving some scope and range. In much of the research found, there were consistent research questions, aims and methods with similar and consistent findings. This repeatability adds to the reliability and validity of the research [20]. Direct applicability to Australia and the Australian health care system for home based telepsychiatry in the acute phase was limited due to a lack of local research and overall lack of research worldwide [8]. Home treatment by telepsychiatry is extensively used in other jurisdictions for certain conditions such as PTSD funded by veteran services [23]. However, while there is compatibility, it is not directly known if that success can be duplicated in a general community mental health setting. Given the lack of local data, further local research is required for home based telepsychiatry. However, based on the strength of overseas services, it is recommended to

move to implementation of local trials and expansion of current emergency department telepsychiatry sites in NSW. The findings of the present review support continued efforts to triage, assess and plan follow up using the principles of least restrictive care and safe referral out of the emergency department.

## CONCLUSION

This literature review has explored the feasibility of acute psychiatric assessment in the emergency department and subsequent follow up in the community using videoconferencing technology to create a true integrated telepsychiatry service.

The literature search found no direct examples of this proposed model. However, when the service location and components were split into emergency department assessment and home based telepsychiatry it was found that telepsychiatry in both those areas had merit and equivalence to face to face review with the added benefit of wider access and timeliness to specialist assessment and treatment. However, in the case of home based telepsychiatry there are more complexities and obstacles which need further consideration such as safety, fair access and technical limitations. Additionally, in recent weeks there has been the catalyst of the COVID-19 crisis where there is a rapid transition to remote videoconferencing care, from circumstantial necessity, this may yield more useful data but also has the risk of wasted opportunity if the previous literature is not considered.

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## APPENDIX

**TABLE OF THE SEARCH TERMS AND RESULTS USING MEDLINE DATABASE**

Searches	Results	Types
telepsychiatry OR mental health telemedicine OR telemedicine OR telehealth OR videoconferencing OR mental health videoconferencing OR telepsychiatry ethics AND acute community AND emergency assessment	9547	Advanced
English language and yr="2005- 2020	1521	Advanced

**TABLE OF THE SEARCH TERMS AND RESULTS USING CINAHL DATABASE**

Searches	Results	Types
telepsychiatry OR mental health telemedicine OR telemedicine OR telehealth OR videoconferencing OR mental health videoconferencing OR telepsychiatry ethics AND acute community AND emergency assessment	5124	Advanced
English language and yr="2005- 2020	976	Advanced

**TABLE 1: SUMMARY OF THE KEY FINDINGS FROM THE STUDIES INCLUDED IN THE REVIEW**

Author(s) / Year of Publication/Country	Study Method/Design	Key Findings of the Study
Bolle et al., 2018. Norway	Qualitative design, video conference between on-call psychiatrists based at home with remote emergency centres. Follow up semi structured interview with participating staff, n = 24	Clinician perceptions who received clinical assistance in emergency centres from mental health clinicians. Found telepsychiatry to be supportive in reducing uncertainty in planning, assessing severity of presentation and resolving disagreement between clinicians.
Narasimhand et al., 2015. USA	ED based. Study over four years, n = 7261 telepsychiatry interventions which were compared to a matched control group using regression analysis	In the telepsychiatry group, admission rate was lower, overall treatment cost was lower and follow up rates were higher. Authors hypothesise that rapid access to expert mental health personnel drives the improvement rather than telepsychiatry in itself.
Reilford and Adebanjo, 2019. USA	Data analysis of presentations to a paediatric ED that required a MH assessment, explored length of stay and on call staff satisfaction	Found direct reduction in length of stay to ED where TP was used. Increased on call staff satisfaction.
Saurman et al., 2015. Australia	12 participants from across NSW, semi-structured interviews of ED staff and one GP on perceptions of telepsychiatry in the ED across several NSW local health districts	Interview based on the "six concepts of access" summarised as right care from the right service at the right time. Positive reception to service as filling an unmet gap.
Saurman et al., 2014. Australia	Patterns of use in ED telepsychiatry between remote health districts. Quantitative data. 1487 clinical encounters	Compared remote and very remote telepsychiatry assessments and disposition outcomes. Very remote EDs had a higher rate of admission post assessment. However, those admissions were found suitable for local admission rather than transferring the patient out to a regional centre.
Thomas et al., 2018. USA	Children's hospital ED. 493 post discharge surveys split into two groups receiving telepsychiatry and usual care. Measurement of discharge disposition, length of stay in ED, cost and staff carer satisfaction	Telepsychiatry had a 5% higher return visit rate, significant lower cost, less time in the ED, less requirement for transfer to another facility for specialist assessment, Carer satisfaction was high comparatively, staff satisfaction less so with telepsychiatry.

Tronsden et al., 2018. Norway	Thematic study, 29 semi structured interviews with consumers and clinicians	Found four pragmatic contributions to the positive findings for TP. 1. Immediacy of assessment. 2. Open transparency during assessment and planning. 3. Access to specialist clinician. 4. Promotes consumer involvement in decision making
Cipolletta et al., 2018. Italy	Two psychotherapists and five clients, conversation analysis	Videoconference therapy sessions were recorded and content analysed for differences in therapeutic relationship compared to face to face. Found no great difference with online sessions.
Gamble et al., 2015. Australia	Application of current ethical standards in psychology to telepsychiatry	The original article identifies current ethical expectations and applies to telepsychiatry as it emerges as a more popular medium and highlights privacy, data storage and maintaining regulatory standards.
Gros et al. 2018. USA	Randomised controlled study, PTSD treatment for veterans (n=67) via home based telepsychiatry	Study focussed on patient perceptions and subjective experience. No difference found in perception of quality.
Gilmore and Ward-Ciesielski, 2019. USA	Perceived risks of telepsychiatry in higher risk cases via online questionnaire of 52 therapists	Concerns were less patient control, perception of missing key information. However, younger therapists were more comfortable with video assessment
Hogan et al., 2019. USA	Case Studies (n=5) in home telepsychiatry	Presentation of five case studies that successfully used home telepsychiatry in more challenging and higher risk clinical presentations.
Hungerbuehler et al. 2017. Brazil	Randomised controlled trial, 107 participants, effectiveness of home based telepsychiatry (n=53) vs centre based (n=57) for outpatient follow up	Participants recovery was rated by treating psychiatrist and self-assessed with a questionnaire. Study found no difference between telepsychiatry of clinic based treatment.
Lai et al., 2020. The Netherlands	Perspective of young consumers with first episode psychosis of home based telepsychiatry. 51 participants, Likert scale satisfaction survey	Themes, loss of human contact, fear will replace all direct contact, fear conversation will be recorded and confidentiality.
Strachan et al., 2012. USA	Randomised controlled study. Treatment of PTSD in veterans, larger cohort (n=227)	Study over four years, no difference in outcome from telepsychiatry vs clinic based treatment. Also, qualitative reporting of high degree of patient satisfaction and convenience from home based telepsychiatry.
Sabin and Skimming, 2015. USA	Review and discussion paper on a telepsychiatry ethics framework, peer reviewed	Addresses the common concerns as cited in other literature such as informed consent, safety, privacy and confidentiality. However, they discuss equity of access as being a strong ethical consideration.

Shulman et al., 2017. USA	Pilot study over six months, 22 participants split into two groups, one assigned to teleconference follow up, the other via a clinic	Study was to measure appointment adherence to the planned videoconference sessions, they found that videoconferencing verses clinic based review made little difference in appointment attendance rate, both had good adherence.
Taylor et al., 2015. Australia	Perception of technical quality of home videoconferencing quality n=1020 sessions	91% of the teleconferencing sessions were successful from a technical quality over 3G connection.
Thompson et al., 2012. EU	Review and discussion paper in older cohort for home based videoconferencing	Defines consent in the telehealth area and ethical considerations for an aging population and technical literacy, variable access to the internet can lead to inequality.
Wagner et al., 2013. Switzerland.	Randomised controlled trial with 62 participants for treatment of depression	Two groups, telepsychiatry and clinic based. No difference found between the groups initially. However, telepsychiatry group had maintained improvement at three-month review, more so than the clinic group.
Yuen et al., 2015. USA	Randomised controlled study. Treatment of PTSD in veterans (n=52)	Found no statistical difference in outcome from telepsychiatry or clinic-based assessment. Both facilitated recovery.