

Developing telepsychiatry services in KwaZulu-Natal – an action research study

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Abstract

Objective: In 2009, the Departments of Psychiatry and Telehealth of the University of KwaZulu-Natal (UKZN) initiated a three year project to develop telepsychiatry services in KwaZulu-Natal. This paper describes the challenges and opportunities of this project. **Method:** This was a collaborative, in situ health service project and an action research framework was adopted. Over the three years, following a needs assessment and an e-health Readiness Assessment, two action research cycles were completed. Cycle 1: The preparation, implementation and evaluation of educational material, technical requirements and clinical guidelines and clinical support materials. Cycle 2: Preparation and evaluation of educational and clinical outreach sessions. **Results:** Video-conference education sessions were beneficial to health staff without post-qualification psychiatry training. A flexible format for education improved knowledge outcomes. Clinical sessions are feasible, but require administration and technical support for facilitation. With facilitator training, 128Kbps is a suitable bandwidth for education but 384Kbps is preferred for clinical consultation. **Conclusion:** Telepsychiatry offers tremendous potential to facilitate the three strategies suggested by the World Psychiatric Association to address the treatment gap, save time and costs and improve access to the small pool of specialist psychiatrists in resource constrained environments.

Keywords: Videoconferencing; Psychiatry; Telepsychiatry; Tele-education; South Africa

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Introduction

Neuropsychiatric conditions account for around one third of Years Lived With Disability among adults aged 15 years and over¹, but more than 50% of people go untreated and in low and middle income countries the treatment gap is as high as 90%.²

In KwaZulu-Natal(KZN) province of South Africa, the lifetime prevalence of mental illness is 28%.³ Mental health services in the province are in a state of neglect and the province has only a quarter of the number of psychiatrists required to meet national norms.⁴ In addition, mental health services are not equitably distributed, with specialists localized to urban areas, usually around academic centers.⁵ In a recent study of the needs of the 50 regional and district hospitals in KwaZulu-Natal designated to

provide mental health care, more than two thirds of the hospitals reported having inadequate staff to provide mental health care and only a third of the hospitals provide a mental health outpatient service.⁵ Although the regional hospitals are in general better staffed and equipped to admit, observe and treat involuntary Mental Health Care Users (MHCUs), three of the twelve regional hospitals did not have a resident psychiatrist.⁵

Given the existing resource constraints⁴, the number of psychiatrists is unlikely to increase in rural areas. More efficient use of existing specialists needs to be made to overcome the inequitable distribution. Psychiatric outreach services offer a feasible short-to-medium term solution. Outreach services are, however, reported to be inefficient, because specialists are required to travel long distances by road or devote a day to travel and consult using the 'flying doctor service'. The challenge to healthcare providers is to find innovative, cost-effective alternatives to meet this crisis in mental health service delivery.

A World Psychiatric Association (WPA) survey concluded that scaling-up of mental health services can

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only be effectively achieved if three elements are in place: task-shifting to non-specialist providers, increasing specialist mental health resources to provide effective and sustained supervision and support and decentralizing specialist mental health resources.⁶ Telepsychiatry, through the use of videoconferencing, has the potential to address all three elements. Telepsychiatry has been reported to be both cost and time-efficient⁷⁻⁹ and can provide an array of services, including, but not limited to, clinical services such as assessment, diagnosis, medication management, second opinions¹⁰⁻²⁰, and supervision and education.²¹

In 2009, the Departments of Psychiatry and Telehealth at the University of KwaZulu-Natal (UKZN) initiated a project to develop telepsychiatry services in KwaZulu-Natal. The province is well equipped to provide telepsychiatry services with current videoconferencing facilities available at the Nelson R Mandela School of Medicine, the School of Nursing, three of the psychiatric hospitals and 30 Regional and District Hospitals. The Department of TeleHealth at UKZN provides an average of 6.5 hours of videoconference-based medical education teaching per day.²² In 2010, on request from the KwaZulu-Natal Department of Health (DOH), a business plan for a pilot project was submitted and approved for implementation during the first few months of 2011.

This paper describes the challenges and opportunities of the collaborative project between the Departments of Telehealth and Psychiatry (UKZN) to develop telepsychiatry educational and clinical outreach services in a resource constrained environment. For the purpose of the study, the telepsychiatry service included specialist and non-specialist education in psychiatry and the provision of clinical videoconference consultation as part of the routine clinical outreach service.

Method

This was a collaborative in situ health service project, and an action research framework was adopted. Action research is a systematic, cyclical, participatory and collaborative research approach, enabling exploration of key issues and the formulation of actions.²³ Action research arises from a need identified by stakeholders in a specific context and normally includes the following steps: Planning: collaborative development of objectives and planning to achieve the objectives; Action: implementation; Evaluation: monitoring the implementation of the actions using mixed methods and field notes; and Reflection: reflecting on the actions implemented, identifying strengths and weaknesses and potential modifications.²⁴ The action research framework used a mixed method approach of both quantitative and qualitative designs for different steps in the research. Over the three years, following a needs assessment⁵ and an e-health Readiness Assessment²⁵, two action research cycles were completed.

- Cycle 1: The preparation and evaluation of educational material, technical requirements and clinical guidelines and clinical support materials.
- Cycle 2: Preparation and evaluation of educational and clinical outreach sessions.

Table I: Participants in Study

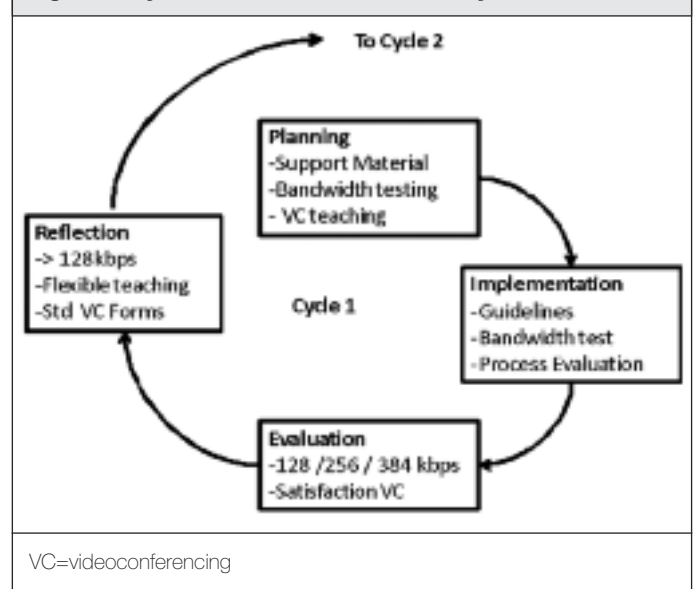
<p>Cycle 1</p> <ul style="list-style-type: none"> • UKZN Teaching and Technical Staff • Research Group (Psychiatrist, Telehealth Specialist & Researcher) • Bandwidth Testing: (3 Consulting hospitals, 1 Registrar, 7 Psychiatrists) • Videoconference Sessions (2 local hospitals, 12 participants)
<p>Cycle 2</p> <ul style="list-style-type: none"> • DVD Sessions (1 Consulting Hospital, 2 local hospitals, varied no. of participants) • Clinical Sessions: (1 Consulting Hospital ~ 1 Local Hospital) & (1 Consulting Hospitals ~ 2 Local hospitals) • Research Group (Psychiatrist, Telehealth Specialist & Researcher)

As the study aim was to develop telepsychiatry in the province and to facilitate change to the current psychiatric outreach services, stakeholder engagement was of central importance in the study. Psychiatrists and hospitals that expressed an interest in telepsychiatry services were identified to participate in the study. Table I provides a list of the hospitals and the participants in the study. The research group for the study included the principal researcher, a telehealth expert and a consultant psychiatrist. The study participants included relevant psychiatrists, medical officers and other staff in the participating hospitals involved in the implementation of the study. Overall four consultant hospitals (hospitals with psychiatrists) were chosen to participate in the study, with a total of four consultant psychiatrists and five local medical officers from these settings. Ethical approval for the study was obtained from the Bioethics and Research Committee of UKZN.

Cycle 1

Cycle 1 commenced in 2009 with three preparatory activities: a) the development of clinical guidelines, b) the evaluation of different bandwidths for clinical sessions, and c) the testing of videoconference-based in-service education sessions with rural designated hospitals (Figure 1).

Figure 1: Cycle one: the action research cycle



Clinical guidelines and support materials

In order to guide the preparation of clinicians for participation in telepsychiatry, clinical guidelines and support materials were developed collaboratively by the Departments of Psychiatry and Telehealth.²⁶ These documents included guidelines, standard operating procedures, a standard referral form, an information sheet, a consent form, a telepsychiatry log sheet, and a telepsychiatry clinical record sheet. The development of the guidelines is described elsewhere.²⁶

Bandwidth testing for clinical outreach telepsychiatry services

In a review of international telepsychiatry studies, some studies reported lower reliability in videoconference assessments at low bandwidth.⁸ The rate of data transfer affects picture clarity and latency has important implications for the validity and reliability of psychiatric examinations. A minimum of 128Kbps provides adequate sound and image quality for psychiatric consultations, but 384Kbps is the preferred bandwidth.²⁷ A study by Zarate, Weinstock et al. showed that recognition of negative symptoms of schizophrenia was less reliable at 128Kbps than at 384Kbps, although reliability of other clinical measures was similar at the different bandwidths.²⁸ Videoconferencing at a bandwidth of 128Kbps may have latency or delay between the sound and picture of up to 0.3 seconds. This lack of synchronicity can be distracting. Latency is reduced at higher bandwidths. Even though there is evidence that suggests that there is a slight superiority of Internet Protocol (IP) connectivity over ISDN connectivity²⁹, there is acceptance that 128Kbps is adequate for some clinical applications.³⁰

Planning

Most hospitals in the province connect at 128Kbps for videoconferencing using ISDN lines. This has been successfully used for education of doctors and nurses.³¹⁻³³ As few of the psychiatrists in KwaZulu-Natal have experience in videoconference-based telepsychiatry, there were concerns that they might not be comfortable offering clinical services at bandwidths as low as 128Kbps.

Implementation

A bench top study was conducted to compare three different bandwidths, 128Kbps, 256Kbps and 384 Kbps, provided by IP or ISDN connection for clinical psychiatric assessment. Psychiatric registrars and consultants were invited to participate in this study on a voluntary basis. Three tests were conducted: 1) Twelve connections were made, four at each of the three selected bandwidths. Two of the four connections were made over the Internet (IP) and the other two using ISDN lines. Participants were blinded while each connection was made to ensure that they did not know which bandwidth or connection was made. 2) In a second study, two connections at 128Kbps were made from the university to two different consultant hospital sites. The consultant hospital sites were equipped with data projectors, screens, microphones and speakers. In all tests, the participants were blind to the bandwidth. Selected psychiatric presentations of agitation and low affect by a simulated 'patient' were demonstrated. The psychiatrists were blinded to the bandwidth and the method of connecting. In all cases, a bandwidth checklist was administered to the participants from the consultant hospital sites. The checklist focused on: quality of sound and picture, comfort and capacity to create presence, and general

satisfaction and acceptability of using videoconferencing for clinical consultations.³³ The checklist was rated on a 3-point Likert scale from 2 (Very Satisfied) to 0 (Not Satisfied). A satisfaction score for each connection was calculated based on the ratings for the quality of the picture and the connections were then ranked from worst to best. 3) A once-off connection at 128Kbps was also made between a consultant psychiatrist and a medical officer at a regional hospital to test the feasibility of case discussion at this bandwidth.

Evaluation

During the first bandwidth test, 5 mental health professionals (3 psychiatrists, 1 registrar and 1 psychologist) participated in rating their satisfaction with different bandwidths. All the participants were satisfied with the sound, felt they were able to establish a therapeutic connection with the 'patient' and felt comfortable to use the technology to assess the 'patient'. Satisfaction with the picture quality at higher bandwidths was greater than at lower bandwidths (Table II) but all the participants felt that the technology was appropriate for assessment and diagnosis in psychiatry and rated themselves as 'confident with using videoconferencing for teaching' (average 7.2).

Table II: Satisfaction with picture quality for assessment at different bandwidths (n=5)

Item		Average Satisfaction /12	Ranking
Bandwidth	ISDN 384	12	1
	IP 384	8	2
	ISDN 128	3	11
	IP 128	3	12

During the second bandwidth test, three consultant psychiatrists and a psychiatric registrar participated in bench top testing at 128 Kbps. The psychiatrists were blind to the bandwidth. The following themes emerged from the reports:

- **Quality of sound:** Sound quality was adequate when interviewing, even when the interviewee was mumbling or speaking rapidly.
- **Quality of picture:** 128 Kbps was adequate to identify "low affect facial expressions". The bandwidth was questionable when the interviewee displayed rapid dystonic movements or agitated movements with reports of a "visual lag in picture" and a 'pixelated' picture affecting quality. The camera angles were adequate when panning and zooming to see the whole person, though these functions were thought to add an additional technical complexity. The visual lagging of the picture was reported as "robotic" and "artificial".
- **Comfort and capacity to create a therapeutic connection:** The psychiatrists indicated that they were confident that they would be able to establish a therapeutic connection with the patient, but that this would be dependent on the quality of the picture and the sound at the time.
- **Satisfaction and Acceptability:** The technology was rated as being appropriate for assessing and diagnosing a 'patient', although the psychiatric registrar's ratings were less confident. It was recommended that the use of a standard referral form provided to the consultant prior to a session would enhance the process.

- **Venue:** Two of the psychiatrists reported dissatisfaction with the venues as these were not designed for clinical sessions. The venues were noisy, not private and not adequately lit. Two facilities had TV monitors previously stolen from the venue despite equipment being in security cages.

During the third bandwidth test, a consultant psychiatrist and a medical officer participated in bench top testing at 128 Kbps to discuss a case. The connection was adequate for case discussion but a recommendation was made that a standard referral form should be received prior to the session and that staff at both sites needed training.

Testing of Videoconference-based outreach teaching

Two district hospitals participated in testing using videoconferencing for outreach psychiatric education sessions health staff without post-qualification psychiatry training, for example Medical Officers and General Nursing Staff.

Planning

The Department of Psychiatry identified six topics to be covered in one hour teaching sessions to develop capacity in health staff without post-qualification psychiatry training. These sessions were: Introduction to the Mental Health Care Act, Psychosis, Depression, Management of the aggressive patient, Psychopharmacology and Telepsychiatry. The sessions were to be broadcast at 8am on Friday mornings to two district hospitals using 128 Kbps ISDN lines over a period of 6 weeks. The hospitals were a round trip of 400km from the sending site at UKZN.

Implementation

A quantitative process evaluation of the videoconference-based education sessions was conducted using a routine telehealth process evaluation form³² which measures quality of

videoconferencing against four criteria and a standard of 75% agreement.³³

Evaluation

A total of 12 participants attended the videoconference education sessions. The 8 participants from one of the hospitals completed the evaluation forms (4 medical officers, a medical student, a manager and 2 other health professionals). The results of the process evaluation are displayed in Table III.

Only one participant was familiar with videoconferencing and five of them had previously attended a videoconference based educational session. Overall the participants were satisfied with the presentations via videoconferencing with only three criteria of dissatisfaction reported for interaction, initial technical problems and the quality of the picture at 128 Kbps. However, a major problem reported by both hospitals was the fixed timeslot which, due to clinical work demands, made attendance difficult.

Reflection Cycle 1

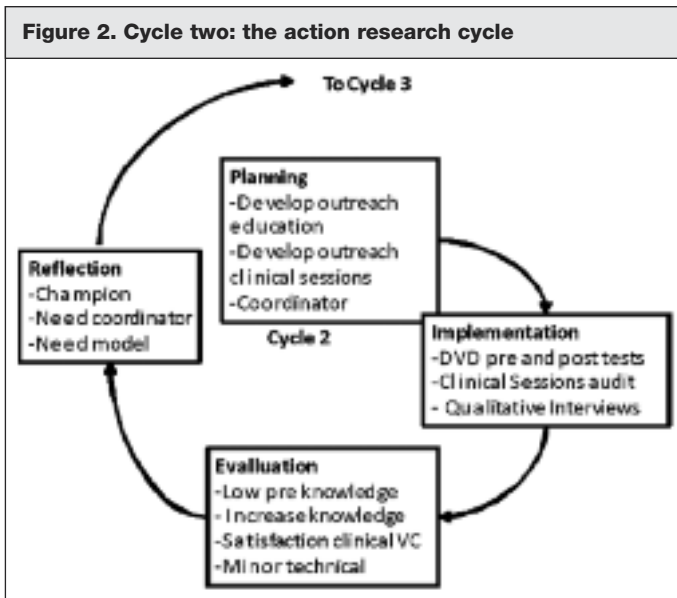
- **Support material:** A standard referral form should be provided prior to a telepsychiatry session.
- **Flexible education format needed:** Education sessions were beneficial to health staff without post-qualification psychiatry training, but could be offered in a more flexible medium. It was recommended that the sessions be revised to enable recording to DVD as a low level technology solution which has previously proved to be successful in resource poor environments.³⁴
- **Education Bandwidth suitability:** For training, 128 Kbps is a suitable bandwidth.
- **Clinical Bandwidth suitability:** 128 Kbps is not the preferred bandwidth for clinical consultation and should only be used when the clinician is comfortable in his ability to make the assessment at this bandwidth.

Table III: Process evaluation of videoconference-based education sessions

Criteria: Appropriateness of videoconference-based teaching for Mental Health (n=8)	%
Videoconference-based teaching is as effective as traditional face to face teaching	6 (75%)
Videoconference-based teaching allows for same level of interaction effective as traditional face to face teaching	2 (25%)
Videoconferencing is an excellent educational tool	7 (88%)
Videoconferencing is an appropriate tool to teach psychiatry	7 (88%)
Satisfaction with videoconference-based education program (n=8)	%
Use of videoconferencing as an education tool	4 (50%)
Overall presentation of program using videoconferencing	7 (88%)
Participant would attend more sessions offered by videoconferencing	7 (88%)
Participant would attend videoconferencing rather than travel to Medical School	7 (88%)
Satisfaction with Technical issues during presentations (n=8)	%
Audio quality during presentations	5 (63%)
Audio quality during discussions	5 (63%)
Picture quality during presentations	7 (88%)
Picture quality during discussions	3 (38%)
Picture quality of PowerPoint slides	6 (75%)
Picture quality of anatomy specimens or models	6 (75%)

Cycle 2

Cycle two commenced in 2010 and continued in 2011. It included a) the development, implementation and evaluation of educational sessions on DVDs for outreach psychiatry education and b) the commencement of clinical outreach telepsychiatry sessions using a champion model (Figure 2).



Outreach psychiatric education sessions using DVDs

Planning

Two local district hospitals participated in testing the DVDs to build capacity in health staff without post-qualification psychiatry training. The Department of Psychiatry modified the topics and developed six one hour sessions. These were: The Mental Health Care Act, Depression, Psychosis, Confusion, the Aggressive patient and the Mental Status Examination. The sessions were recorded using commercial software Authorgen® (authorGEN Technologies, Concord NC), a program which captures the presentation slides and a video of the lecturer presenting the session. The presenter is filmed using a digital video camera and the digital audio and video signals are connected to the computer running the presentation and the Authorgen software which synchronizes the presentation slides, audio and video signals which are saved to the hard drive in real time. The output is a slide presentation with the embedded video and voice of the presenter. The presentation is then saved to DVD and can be viewed using an Internet browser. Each DVD session was evaluated using a pre- and post- content questionnaire developed by the presenters. Differences between pre and post scores were tested using independent two tailed T-Tests with alpha set at 5%.

Implementation

The DVDs were distributed to two participating hospitals for use and evaluation between January and March 2010. The difference in the pre- and post- tests was tested and the DVDs were evaluated for quality and ease of use. Twelve participants in one local hospital watched four of the sessions over a three month period and completed the pre- and post- test questionnaires. Due to the unavailability of the Medical Officer responsible for mental health care services, the second hospital did not participate. A psychiatric hospital also started using the DVD subsequently for the training of medical students and interns.

Evaluation

Pre and post evaluation of sessions were completed by medical officers from the local hospital and medical students from the psychiatric hospital (Table IV). Participants chose not to identify themselves and the data are therefore not paired. Overall the participants' pre- knowledge was moderate to good with average scores ranging from 72% to 85%. There were significant or near significant increases in knowledge in all post sessions evaluations (except for the Confused Patient) ranging from 5.8% to 18.8 % (Table IV). The DVDs were thought to be of good quality, though one hospital reported that the instructions for using the DVD were complicated. Once the formal evaluation period of January to March was over, the use of the DVDs for formal education sessions stopped.

Outreach psychiatric clinical consultation sessions

Planning

In 2011, psychiatrists at two hospitals commenced clinical outreach telepsychiatry sessions to one and three designated hospitals respectively in each of their regions. The local hospitals are designated under the Mental Health Care Act to provide mental health care and were located about 3 hours driving time from the consulting hospitals. Both consulting hospitals had psychiatrists with active psychiatric outreach programs. The psychiatrists had previous experience in telepsychiatry and acted as local champions. The set of guidelines and supporting documents developed in cycle one were provided to the hospitals.

Implementation

Mixed methodologies using both quantitative and qualitative designs were used to evaluate the clinical sessions. For each telepsychiatry session, a routine audit form on the process of the session and quality of the audio and video during the session, developed as part of the guidelines in cycle one, was completed. A follow up qualitative interview was conducted

Table IV: DVD Evaluation (Pre and Post Tests Scores /20)

Sessions Conducted	No. of participants	Mean Pre-score	Mean Post-score	Average Knowledge Change
Mental Health Care Act	8 & 8	15	18.8	3.8 p<.01
Depression	11 & 13	16.5	18.9	2.5 p<.01
Confused Patient	14 & 14	16.9	18.6	1.7 p=.13
Psychosis	7 & 8	14.9	17.0	2.1 p=.06
Mental Status Examination	16 & 15	14.4	15.5	1.7 p=.05

with three of the consultants and one medical officer who participated in the clinical consultations, using a semi-structured interview schedule. In addition, the coordinator of a successful telepsychiatry service in Australia was also interviewed. Key domains investigated were: The experience of a telepsychiatry session, technical issues, benefits, challenges and recommendations for improvement. Data from the interview transcripts were analyzed using content analysis.³⁵ The text from field notes was analyzed for meaning units which were condensed into categories and subcategories.³⁵ When data are collected over a long time, there is a risk of inconsistency and the interview process can influence subsequent questions.³⁶ Trustworthiness was established by selecting appropriate meaning units based on the literature on telepsychiatry implementation (credibility). Trustworthiness also includes the transferability of the findings to other settings and dependability.³⁶ To facilitate transferability, the resource constrained context was clearly described and the participating sites were appropriately identified. To ensure dependability, an open dialogue was maintained with the research team.

Evaluation

The clinical sessions were generated by the local hospitals, driven by a need for liaison with the consultant psychiatrist. One consultant hospital conducted two sessions following a request from the local referral hospital, one of which was an assessment of an adolescent. The other consultant hospital conducted five follow up sessions by telepsychiatry seeing 4 to 5 patients per session. These sessions alternated monthly with the face to face consultant outreach sessions. All sessions were conducted at a bandwidth of 384 Kbps. Sessions ranged from 30 minutes to 1 hour per patient. In all cases, an explanation was given to the patient, the patient gave consent for the session and the session was not recorded. No guardian consent was required. All sessions were multidisciplinary. The evaluation of the clinical sessions is presented in Table V.

None of the venues were dedicated telepsychiatry venues. Initial sound and picture quality problems at the local hospitals were reported by both consulting hospitals which with the exception of picture quality at one hospital were subsequently resolved. In both cases at least one or both of the doctors required a translator to converse with the patient in his or her own language. The consultant elected not to zoom in on the patient and the camera was focused on all three participants at the local site.

The following benefits emerged from the content analysis of the interview notes:

- **Access:** "Access to tertiary level expertise without having to travel long distances" and "Avoids admission for assessment as child assessed in local setting".
- **Clinical Effectiveness:** "Highly useful form of outreach, clinically effective in terms of diagnosis and management plan or decision regarding admission, time efficient"; "Useful to provide reassurance in confirming the diagnoses made locally"; "Multidisciplinary teams on both sides, direct observation of child, information from all role players together at one session".
- **Clinical issues:** "Psychotherapy sessions, parenting sessions, training or behavior modification programs are

easier to implement". "New services should start with follow up cases."

- **Mentoring and supervision:** Mentoring provided by the psychiatrist during the clinical consultation was seen as beneficial.
- **Videoconferencing facilities in units:** "Videoconferencing from the child unit would be ideal, for example using Skype, this will make booking times sooner, each member of multidisciplinary team able to record reports, psychotherapy sessions or parenting training, easier to implement behavior modification programs and provide training. It also will make follow up easier."

The following challenges emerged from the content analysis of the interview notes:

- **Administration:** "A lot of time spent coordinating the scheduling and booking between the local and consultant sites"; "Conflicting venue bookings between sites and hospitals". "Bookings delayed due to difficulty finding mutually convenient times"; "Challenges of documenting information during process."
- **Telepsychiatry set up:** "Artificial nature of set up"; "Relying on interpreter and interpreter reliability". Consultant relied on the main trust relationship to be the one between the local doctor and patient.
- **Buy-in:** "High turnover of local doctors which required continual and ongoing training and buy in from local doctors to continue the program"; Buy-in and involvement of members of multidisciplinary team.
- **Technical issues – Picture quality:** "Picture quality a challenge"; "The low lighting in the local venues made it difficult to see patients' facial expressions clearly."
- **Technical issues – Audio quality:** Poor quality was reported at the initial sessions and was due to videoconferencing units being used in venues established for education sessions.
- **Technical issues – Connections:** "Challenges at times with linking up with peripheral area due to power outage"; "Lack of local support technicians contributed to the delay in sessions when there were minor technological hitches."

In addition, the researcher interviewed a successful Child and Adolescent Telepsychiatry Coordinator from Australia. The service runs 4 clinics to remote districts as part of their service agreement. The following factors for success emerged from the content analysis of the interview notes:

- **Coordinator –** "The key to the success is having a coordinator for the service who is also a clinician." The role of the coordinator is to coordinate the sessions, debrief staff and support and train remote staff.
- **Service Agreement:** The service is provided as part of a service agreement between the central district and the remote districts.

Reflection on Cycle 2

- **Education:** The flexible format for education was effective, but instruction and format needs to be simplified and accompanied by a standard evaluation form. In addition, there was a concern that, once the study ended, the use of the DVDs stopped. It is recommended that the education

format should be flexible to enable participants to select which format is most suitable for them.

- **Clinical Sessions:** Clinical telepsychiatry sessions at 384 Kbps in this context were feasible once technical problems were resolved. The one site has continued with clinical videoconferencing in 2012.

- **Administration:** Administration was a burden which required central coordination, a dedicated site coordinator, the use of the referral sheets and advance booking using standard booking, scheduling and recording systems.
- **Awareness:** Awareness raising and change management is central to the success of any telemedicine implementation.

Table V: Clinical Outreach Sessions

Site 1 (n=2) March 2011						
<i>Pts/Session</i>	<i>Presenting problems</i>	<i>Type of Session</i>	<i>Present Consulting Site</i>	<i>Present Local Site</i>	<i>Key Decisions</i>	<i>Quality of Sessions</i>
1	Adjustment Disorder	Adolescent Assessment	Consultant	Medical Officer, Student, Nurse, Psychologist & Patient	Admission	Sound: Good Picture: Good Timeliness: Good Ease: Good
1	Delusional Disorder	Adult follow up	Consultant Psychiatrist	MO & Patient	Medication Management	Sound: Poor Picture: Poor Timeliness: Delay Ease: Good
Site 2 (n=29) March – December 2011						
<i>Pts/Session</i>	<i>Presenting problems</i>	<i>Type of Session</i>	<i>Present Consulting Site</i>	<i>Present Local Site</i>	<i>Key Decisions</i>	<i>Quality of Sessions</i>
5	Schizophrenia & Mood Disorder (individual patients not specified)	Adult follow up	Consultant Psychiatrist & Registrar	Medical Officer, Nurse & Patient	Confirmation of Diagnosis Confirmation of Treatment Medication Management	Sound: Poor Picture: Poor Timeliness: Good Ease: Good
5	Schizophrenia & Mood Disorder (individual patients not specified)	Adult follow up	Registrar	Medical Officer, Nurse & Patient	Confirmation of Diagnosis Confirmation of Treatment Medication Management	Sound: Poor Picture: Poor Timeliness: Good Ease: Good
5	Schizophrenia & Mood Disorder (individual patients not specified)	Adult follow up	Registrar	Medical Officer, Patient	Confirmation of Diagnosis Confirmation of Treatment Medication Management	Sound: Poor Picture: Poor Timeliness: Good Ease: Good
4	Schizophrenia (2), Bipolar Disorder (1) Major Depression (1)	Adult follow up	Consultant Psychiatrist & Registrar Observers (2)	Medical Officer, Nurse & Patient & OT Student	Adjustment of Treatment Follow up Referral to psychologist (1)	Sound: Good* Picture: Poor Timeliness: Good Ease: Good *Handheld microphone
2	Schizophrenia & Neuroleptic Induced Parkinsonian Syndrome (1) Bipolar Disorder, Manic Episode, with Psychotic Features (1)	Adult follow up	Consultant Psychiatrist	Medical Officer, Medical Manager Patient	Medication Management Additional Tests ordered Transfer to psychiatric hospital	Sound: Good Picture: Good Timeliness: Delay-Good Ease: Problems - Good
5	Schizophrenia (3) Bipolar Disorder & Pregnant (1) Psychotic disorder (1)	Adult follow up	Consultant Psychiatrists (2)	2 Medical Officers, Nurse & Patient	Medication Management Additional Tests ordered	Sound: Good Picture: Poor Timeliness: Good Ease: Good
3	Major Depressive & Physical problem++ (1) Schizophrenia (1) Dementia & Substance Use (1)	Adult follow up	Consultant Psychiatrist	Medical Officer, Nurse & Patient	Referral (Internal Medicine) Transfer to psychiatric hospital Medication Management	Sound: Good Picture: Poor Timeliness: Good Ease: Good

To this end, the Telepsychiatry Clinical Guidelines and support materials should be widely circulated. Training should be provided for staff at local hospitals and telepsychiatry should be integrated into medical training.

- **Dedicated Equipment and Technology:** Videoconferencing units within psychiatric units would be ideal. Investigating other technologies, such as web-based desk top videoconferencing facilities, is also important for future developments.
- **Training and Support:** Training and support in videoconference etiquette for telepsychiatry is essential for its successful application. With most of the population not being English speaking, it is important to allow for a translator when planning the duration of the consultation session and choosing the optimum visual picture for the consultation. Training of local site staff in videoconference etiquette and basic operation of equipment is necessary. Dedicated technical staff are required to ensure successful telepsychiatry sessions.
- **A Model for Telepsychiatry:** Due to the high turnover of staff in Public Hospitals, the champion model is at risk of failing. It is essential to develop a telepsychiatry model for implementation which should include national and provincial Departments of Health (DOH) directives on telepsychiatry (if in place), a national change management telemedicine strategy and collaboration with other role players such as academic departments at universities and professional colleges. As child and adolescent psychiatry is a highly specialized area with its own particular needs, the adult telepsychiatry strategy should have a dedicated section for this service.

Discussion

Over a period of three years, the beginnings of a telepsychiatry service have emerged. The evaluations from this study show that both educational and clinical telepsychiatry can be implemented but that these services need to be embedded in formal, nationally endorsed, telemedicine and psychiatry outreach policies. The implementation of telepsychiatry in rural environments where there are no established formal outreach policies is more likely to be successful where it is needs driven and where a local champion exists at either or both the consulting or local hospitals. The high turnover of staff at peripheral hospitals, however, puts this model at risk.

Providing ongoing psychiatric education for general medical and nursing staff is essential due to the high staff turnover at hospitals. A systematic review of training programs in health staff without post-qualification psychiatry training found that, despite differences between training programs, training in mental health may improve outcomes in mental health in low and middle income countries.³⁷

This study clearly shows that clinical telepsychiatry consultations are feasible. However, to ensure reliability, bandwidths in excess of 128 Kbps are preferable. In KwaZulu-Natal, only seven of the videoconferencing sites have access to a bandwidth of 384 Kbps or more bandwidth, provided by ISDN connection. Internet (IP) bandwidth provided by KwaZulu-Natal Department of

Health is inadequate for videoconferencing as most hospitals are assigned a total of 128Kbps for all internet and Web based activity. Clinical telepsychiatry services can be provided at 128 Kbps if the psychiatrists are comfortable with the quality of the picture and audio. To ensure technical reliability in developing telepsychiatry in Africa, it is essential to provide technical support at both the consultant and local hospitals. Videoconferencing equipment and support before and during the telemedicine sessions needs to be provided by suitably qualified technicians and staff trained in the support of telehealth technology. In KwaZulu-Natal there is no technical support at public hospitals.

Issues to consider in developing telepsychiatry services include: raising community awareness, understanding the clinical needs of patients and physicians, gaining practitioner acceptance, ensuring reliability of the technology infrastructure, training of staff, provision of adequate bandwidth, and providing onsite technical support and a local coordinator of clinical telemedicine services.³⁸ Similar findings were reported in India in one of two studies conducted on setting up telepsychiatry services in developing countries.³⁹ The authors identified the following tasks as essential to ensuring an efficient intervention using telemedicine: identifying a suitable technology, a suitable location, and a local collaborator; providing training and creating awareness; establishing peripheral telepsychiatry centers and ensuring case documentation and accountability.³⁹

A concern was that when the study coordination ceased, only one site continued their clinical videoconference sessions. This highlights the need for telepsychiatry to be part of a formal outreach model. Guidelines are essential and telepsychiatry needs to be integrated into normal outreach services with policy directives to include telemedicine in the job descriptions of medical practitioners. All telepsychiatry programs should be supported by the Department of Health and have dedicated site coordinators responsible for coordinating, scheduling, monitoring and evaluating the service and raising awareness in telemedicine and telepsychiatry.

Conclusion

Telepsychiatry has the potential to facilitate achievement of the three strategies suggested by the WPA⁶, to address the treatment gap, to save on time and costs and to improve access to the small pool of specialist psychiatrists in KwaZulu-Natal. The published literature clearly shows that there is little telepsychiatry practised in the developing world.⁴⁰ This action research study demonstrates an approach to setting up clinical and educational telepsychiatry services and identifies obstacles to successful implementation. It supports the observation of Darkins (2001) that the "...major challenge associated with the implementation of telepsychiatry services does not lie in taking the idea to the project stage needed for proof of concept BUT is in paying sufficient attention to the myriad of details needed to integrate models of remote health care delivery into the wider health care system."³⁸ To facilitate this, a sound, evidence-based and well led strategy and model for telepsychiatry in South Africa should be developed.

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