

SFT-16 AUCKLAND

#SFTConference

Successes & Failures in Telehealth

7th Annual Meeting of the Australasian Telehealth Society



31 October - 3 November 2016
SKYCITY Auckland, New Zealand

CONFERENCE PROCEEDINGS



HOSTED BY

Australasian
TELEHEALTH
Society



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The Australasian Telehealth Society (ATHS) was formed in 2008 to create a forum for all of those involved in telehealth in Australia and New Zealand. With a membership of over 500 people, it brings researchers, technicians, telehealth practitioners, clinicians and industry partners together in a unique interdisciplinary grouping and provides a single forum for sharing related issues. It is the only Australasian organisation specifically addressing the needs of the telehealth community.

Some of its roles include:

- Creating a credible channel for bringing issues affecting telehealth to the attention of decision makers and encouraging the use of Telehealth models and services to address issues confronting the Australian and New Zealand health systems.
- Recommending guidelines and standards of practice for telemedicine services ensuring that quality, safety and optimal patient care are maintained.
- Assisting in resolving such issues as billing for telemedicine or the delivery of services across jurisdictional boundaries.
- Investigating and influencing policy/legislative opportunities to integrate telemedicine into mainstream healthcare.
- Keeping our members aware of developments in telehealth.
- Making Australia a part of the international telehealth community, through membership of the International Society for Telemedicine and eHealth (ISfTeH) and other relevant international organisations.
- Organising an annual peer-reviewed national conference (Successes and Failures in Telehealth).
- Sharing ideas and creating conversations around eHealth and telehealth.
- Providing a platform for members to share and discuss the latest research and services available in eHealth and telehealth.

For more information please go to www.aths.org.au

CENTRE FOR ONLINE HEALTH

The University of Queensland's Centre for Online Health (COH) is recognised internationally for its role in research, teaching and service delivery in clinical telehealth. Research success through the COH and its collaborators was recognised in 2013 with the award of the prestigious Centre of Research Excellence in Telehealth by the National Health and Medical Research Council (NHMRC).

www.uq.edu.au/coh



The COH team comprises a broad skill mix which brings together clinicians, academic researchers, educators, technician, engineers and administrators. It provides a supportive environment for research, and is staffed by experts across a wide range of disciplines, such as paediatric, geriatric and rural health care delivered from a distance. The centre offers expertise based on practical experience gained since the centre opened its doors in 1999.

The centre's research has led to the development of several commercial capabilities which are ready for use in day-to-day practice. They include:

- RES-e-CARE: Specialist services through telehealth to residential aged care
- eHAB: Rehabilitation software and services through telehealth
- proACT: Training programs and courses in telehealth
- CeGA Online: Software for assessment and care planning in aged care
- RAIPlus: Training in CeGA Online and interRAI Assessment Systems

The main areas of activity in the Centre for Online Health (COH) are:

- Clinically focused research in telehealth and telemedicine across a variety of settings
- Academic and vocational education and training in e-Healthcare and Clinical Telehealth
- Providing clinical telemedicine services

The COH, in partnership with government and clinicians, has led the innovation and implementation of a number of world first activities, including:

- A fully serviced paediatric telemedicine service
- A child friendly mobile telemedicine service
- A custom designed telemedicine system for neonatal intensive care consultations
- The use of telemedicine for clown doctor outreach
- A mobile, telemedicine enabled, Indigenous Ear Health screening service
- A custom built telemedicine service for adult and aged care based at the Princess Alexandra Hospital in Brisbane

Policy Digest

Comprehensive bank of resources developed by governments and professional groups in the CRE in Telehealth Policy Digest. Resources include:

- » Policies
- » Guidelines
- » Position statements
- » Standards

PLUS

Comprehensive listing of the dimensions covered within these resources for you to easily find what you need.



The Centre of Research Excellence in Telehealth, funded by the NHMRC, aims to accelerate telehealth research in Australia by:

- » Improving health outcomes by translating research findings into policy or practice
- » Developing and expanding capability in telehealth researchers and practitioners
- » Supporting research collaborations.

The CRE in Telehealth Policy Digest is an essential part of the CRE in Telehealth program.



WWW.CREtelehealth.ORG.AU/policy-digest

For further information contact the CRE Program Manager:
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WELCOME

On behalf of The University of Queensland's Centre for Online Health (COH) and the Australasian Telehealth Society (ATHS), we welcome you to the 2016 Successes and Failures in Telehealth Conference (SFT-16). This year, we have aligned with several other well recognised events to expand the reach of every conference to more than 1000 delegates from all around the world. Over the next few days, the blend of clinical telehealth, eHealthcare and health informatics will be reflected in a wide variety of presentations which demonstrate remarkable innovation within our rapidly changing healthcare environment.

The annual SFT conferences are well regarded as one of the leading academic telehealth meetings in the southern hemisphere. The primary goal of the SFT is to provide a forum where people can share their experience with telehealth, reporting aspects which have worked well and also daring to explain things that haven't gone according to plan (the failures). Valuable lessons are learnt from both the successes and failures in telehealth.

The SFT program this year offers a very rich collection of presentations describing a broad range of clinical telehealth applications. This year's SFT program will offer more than 100 presentations in a variety of formats, including academic paper presentations, clinicians' case studies, telehealth panel discussions and poster presentations. SFT keynote speakers will discuss: the organisational challenges of telehealth (Dr Monrad Aas, Norway), the Victorian Stroke Telemedicine Program (Prof Chris Bladin, Australia); and selected telehealth initiatives in New Zealand (Dr Ruth Large, Andrew Slater and Dr Ben Wheeler).

All SFT abstracts will be available on the conference APP and also in the electronic proceedings available to each delegate. In addition, a selection of papers accepted for the SFT-16 conference will be published in the November issue of the Journal of Telemedicine and Telecare.

This conference also serves as the 7th Annual Meeting of the ATHS, a society which was established in 2008 with a vision to deliver a united voice for telehealth advancement, amongst the health sector, academic institutions, government and industry partners. Members of the ATHS and other interested delegates are invited to attend the ATHS Annual General Meeting on the morning of Wednesday 2 November.

We are grateful for the opportunity to partner this year with HINZ and congratulate the organisations ability to orchestrate this event with fine precision. The combination of events this week will no doubt enlighten and motivate everyone involved in this conference. We look forward to your involvement in the SFT conference and thank you for your contribution to this important event. Enjoy New Zealand!



Professor Len Gray
SFT-16 General Co-chair
COH Director



Ms Jackie Plunkett
SFT-16 General Co-chair
President, ATHS



Assoc. Professor Anthony Smith
SFT-16 Scientific Program Chair
COH Deputy Director

SFT-16 CONFERENCE COMMITTEE

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Director, Centre for Online Health, The University of Queensland, Australia

Ms Jackie Plunkett

President, Australasian Telehealth Society, Australia

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SFT-16
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ORAL PRESENTATIONS

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Assessment of the availability and expressed need for services in Dalby - Queensland.

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AIM

As an approach to enhance telemedicine service delivery, a framework for planning telemedicine services based on need assessment was developed. One of the framework steps involves the assessment of the availability and expressed need for services. This framework was applied in Dalby, a regional town in southeast Queensland - Australia. The aim of this study was to identify the healthcare services required by the population of Dalby to assist in the implementation of an appropriate telemedicine service that reflects and meets the needs of the community.

METHODS

This is an exploratory cross-sectional study. Data on the available specialist health services as well as services that patients needed and had to travel outside their area (Dalby) to receive were collected. Data were requested for Dalby patients who were referred to Queensland public health hospitals (excluding referrals to Mater Health) for three years (2012 to 2014), from Queensland Health (Health Statistics Unit) and Princess Alexandra Hospital (PAH) data repositories.

RESULTS

During the three-year study period, there were a total of 27,641 public health services provided to patients living in Dalby. Out of the 27,641 services, there were 11729 (42.4%) referrals to public hospitals outside of Dalby while there were 15,912 (57.5%) services provided locally. Patients were referred for a broad range of specialities (n=32). The three most commonly referred specialities were Orthopaedics 1653 (14%), Allied health 1132 (9.6%) and Oncology 1068 (9.1%). The hospitals most frequently receiving patient referrals from Dalby were Toowoomba Hospital (82.2 km away from Dalby) with a total of 8254 (70.3%) referrals, Princess Alexandra Hospital (207 km away from Dalby) with 2027 (17.2%) referrals, followed by the Royal Children's Hospital (207 km away from Dalby) with 620 (5.2%) referrals. The number of referrals outside of Dalby have increased from 3278 in 2013 to 4301 in 2014.

CONCLUSION

The results of this study indicate that the number of referrals in Dalby population have been increasing over the three-year study period (2012-2014). To cover 42.4% of the healthcare services required by Dalby population, patients had to travel between 82.2km and 207km away from their town. Some of these health services can be provided by telemedicine. These results, along with the results of the other studies conducted under the framework for planning telemedicine services are expected to identify and priorities the needed health services and then assess whether telemedicine can address those needs.

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Telemedicine benefits healthcare systems beyond the patient and clinician.

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AIM

Telemedicine, the provision of healthcare by clinicians remote from patients, is expanding internationally. Multiple medical and economic benefits for regional patients (e.g., access to treatments, fewer transfers) and clinicians (e.g., access to expertise) from telemedicine are reported. However, the benefits beyond the direct objectives of a telemedicine service remain relatively unknown. The aim of this study was to identify system benefits of a state-wide acute stroke telemedicine service beyond the patient and clinician consultation.

METHODS

Since 2010, the Victorian Stroke Telemedicine (VST) program has been a clinical service for regional hospitals in Victoria, Australia. System benefits were assessed through document analysis of governance activities, including Communications Logs and Hospital Site Co-ordinator reports (n= 12 active hospitals). Discussions with VST management (n=3) were undertaken and field notes were also reviewed. A qualitative summative analysis was conducted.

RESULTS

The benefits of telemedicine were identified within and across participating hospitals, as well as for the state government and community. For hospitals, standardisation of clinical processes was reported, including improved stroke care co-ordination. In particular, telemedicine expedited access to the newest treatment for acute stroke care of regional patients. Capacity building occurred through workforce professional development, educational workshops and the use of telemedicine equipment for non-stroke cases. Enhanced networking between hospitals and organisations was facilitated, and resource sharing across hospitals previously operating mainly in silos was achieved. Governments funding telemedicine leveraged program infrastructure to provide immediate access to new treatments. Standardised data collection allowed routine quality of care monitoring. Community awareness of stroke risk factors occurred with media reports on the novel technology and improved patient outcomes.

CONCLUSION

The stroke telemedicine service has shown benefits beyond those involved in the clinical consultation and beyond the original objectives of a clinical service. The value of telemedicine services is extended to healthcare funders and providers.

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Delivering patient education by group videoconferencing into the home: Lessons learnt from the Telehealth Literacy Project.

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AIM

To examine implementation procedures, insights and lessons learnt from delivering group education by videoconference to older people into the home environment.

METHODS

A nested mixed methods study with participants involved in an NBN (high-speed broadband) remote monitoring project. Participants (n=52) were involved 5 weekly group patient education videoconference sessions videoconference, followed by a further week for feedback and evaluation. In total, there were 44 sessions, each comprising of up to 7 participants and the facilitator. Participants could see and hear each other in real-time whilst in their homes using customised tablets or an all-in-one computer. A course journal was maintained by the facilitator throughout the implementation phase of the project and post intervention there were 14 semi-structured interviews and 4 focus groups. A thematic analysis was undertaken with no pre-determined categories. Key themes relating to procedures that hindered or bettered delivering the group sessions are reported.

RESULTS

Accessing group education from home overcame many barriers that existed for attending groups in person. Pre-program aspects which effected the participants' experience of the group videoconferences included the location of videoconference device within the home, scheduling of sessions and test calls. Various technical difficulties were overcome with IT support either by problem-solving with the participants, remotely accessing video conference devices or by home visits. When delivering the group videoconferences factors such as using approaches which enable efficient connection of participants, clear communication strategies and visual aids can be used to provide a highly interactive patient education experience.

CONCLUSION

Group patient education can be delivered by videoconference into homes of older people. Consideration should be given to a number of factors prior to the start of the program particularly for people who live with others. Social presence can be improved by the use of communication strategies. Good IT support is essential and visual aids can be embedded into program structures.

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Smartphone apps for diabetes self-management: Use and beliefs of people in a hospital diabetes clinic and diabetes health professionals in New Zealand.

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BACKGROUND

People with diabetes are using smartphone applications (“apps”) for self-management. There are many apps available for diabetes management with various functions. There are concerns about the safety of some apps, particularly with insulin dose calculations.

AIMS

1. To establish if people with diabetes in Wellington use apps for diabetes self-management and evaluate desirable features of apps.
2. To establish if health professionals (HP) in New Zealand treating people with diabetes recommend apps to patients and which features HP regard as important.

METHODS

A survey of patients seen at a hospital diabetes clinic over twelve months (n= 539) assessing current app use and desirable features. A second survey of HP attending a diabetes conference (n=286) assessing app familiarity, recommendations and perceived usefulness.

RESULTS

About 20% of the 189 responders to the patient survey had used a diabetes app. App users (n=37) were younger and more had Type 1 diabetes. App users most favoured feature was a glucose diary (86.5%, n=32/37) and an insulin calculator was the most desirable function for a future app (45.9%, n=17/37). In non-app users, the most desirable feature for a future app was a glucose diary (64.5%, n=98/152). Of the 115 responders to the HP survey 60.2% had recommended a diabetes app. Diaries for blood glucose levels and carbohydrate intake were considered the most useful app features and the features HP felt most confident to recommend. HP were the least confident in recommending insulin calculation apps.

CONCLUSIONS

The use of apps to record blood glucose was the most favoured function in apps used by people with diabetes, with interest in insulin dose calculating function. HP do not feel confident in recommending insulin dose calculators. There is an urgent need for processes for app vetting to give users of diabetes management apps confidence in quality and safety.

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Telehealth interventions for reducing waiting lists for specialist outpatient service: a scoping review.

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AIM

To summarise and disseminate research findings on telehealth interventions for reducing waiting lists for specialist outpatient services.

METHODS

We undertook a scoping review of published literature and included any telehealth interventions that aimed to restructure or make the referral process more efficient, for example –interventions that reduced inappropriate or unnecessary referrals, supported management of patients in primary care or ensured there was definitive care at first outpatient appointment. We excluded studies that simply increased capacity or simply triaged referrals.

RESULTS

Two categories of interventions were identified i) electronic consultations and ii) image-based triage. Electronic consultations are asynchronous, text-based provider-to-provider communications. The use of electronic consultation has been shown to avoid the need for a face-to-face appointment in between 34% and 92% of referrals. Some authors reported electronic consultations were less costly than a face-to-face consultation. It was identified that not all referrals are suitable for electronic consultations. It was consistently reported that less than 10% of referrals were suitable for an electronic consultation. Large integrated cared providers in the United States (US) account for most of the published use of electronic consultations. Favourable funding models in the US may have accelerated adoption of electronic consultations. Image-based triage of referrals offers the ability for a specialist to reduce inappropriate or unnecessary referrals and in some circumstances facilitate the management of patients in primary care. We identified that image-based triage was practiced in dermatology, ophthalmology, ENT and wound care. For dermatology, the reported rate of avoided face-to-face appointments ranged from 30% to 88%. Avoided appointments for ophthalmology ranged from 13% - 48% and for ENT ranged from 89% -91%. Image -based triage has been reported to be twice as effective as non-image based triage in reducing unnecessary appointments.

CONCLUSION

In Australia, the growth rate of referrals for specialist outpatient services has resulted in 9.7 million additional referrals over the 10-year period to 2014-15. Store-and-forward telehealth consultations may reduce the need for face-to-face consultations, thereby allowing growing number of referrals to be serviced using existing capacity. Substantial infrastructure may be required to implement these interventions.

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Integrating mobile phone in improving adherence to antiretroviral therapy: A qualitative study of clients with HIV/AIDS in Ghana.

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2. University of Ghana, Legon

AIM

Adherence to antiretroviral medication is a major challenge in the management of HIV/AIDS. Mobile phone access and usage has increased in Ghana as in other low and middle income countries and most handsets have basic applications that could be used for effective monitoring of adherence among patient with HIV/AIDS. Evidence suggest the effectiveness of mobile text message reminders in promoting adherence but there is a paucity of literature relating to integrated mobile phone interventions comprising alarm use, weekly text messages and monthly voice call for supporting adherence to medication. The aim of this study was to explore the patients' experiences and perspectives of using integrated mobile phone interventions comprising alarm use, weekly text messages and monthly voice call for supporting adherence to medication.

METHODS

Following a randomised controlled trial to evaluate the effectiveness of using mobile phones to improve adherence to antiretroviral therapy, qualitative data was obtained from 6 individual interviews and 3 focus group discussions on the experience of participants in this study. Interviews and focus groups were transcribed and analyzed for major themes using a framework method of analysis. Rigour was maintained through establishing trustworthiness, dependability, transferability and credibility.

RESULTS

Three major themes emerged from the data, namely: alarm use vs text messages vs voice calls; acceptance vs scepticism; and perceived stigma. Alarm was considered useful and personal, text message was perceived as good but a threat to status exposure. Voice calls were appraised as good with preference for automated voice call and clinical appointment scheduling. Perceived stigma remains a challenge to the integration of mobile phone to support adherence.

CONCLUSION

Attempts at using mobile phone to support adherence in this population must reflect patients' preferences.

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Telecounselling in a mobile youth substance use service - nice idea, but...

Grant CHRISTIE ¹

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CADS Youth Service is a mobile outreach service that provides substance abuse treatment to young people across the wider Auckland region, in homes, schools and community agencies. The distances travelled by AOD clinicians can be extensive and telecounselling seemed to be an ideal way to minimise time wasted enroute to appointments and sitting in traffic. Furthermore, the ability to provide treatment at a time and place that suits teenagers, a group who traditionally struggle to access traditional health services, seemed a major advantage. An engagement model, whereby face to face appointments are alternated with telecounselling sessions was developed to offer a balance between the need for personal engagement and efficiency. We were confident that the youth population that we serve (aged 13 -19) would be able to use the technology and find it acceptable. We provided the technology, guidelines and training to staff and on the few occasions that telecounselling and teleconsultation was used, feedback was generally positive. Despite this, uptake amongst staff and clients was poor and after 12 months or so we remain in a preliminary implementation stage, with telecounselling being used minimally by staff. This presentation will outline our experiences delivering AOD treatment interventions via telecounselling modality and discuss the possible reasons for a lack of success thus far.

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Telehealth in the Northern Territory.

Lisa COLLARD ¹

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The Northern Territory covers about one sixth of the Australian continent with an area of 1.35 million km². With vast distance to travel, tropical weather conditions and many Territorians living remotely, this presents unique challenges in providing health care. Our access to technology has enabled us to meet these challenges effectively and continue to offer high quality health care which best meets the needs of our patients. A full review was done of the Patient Assistance Travel Scheme. Fares and aircraft charters are 100% funded and accounted for approximately 78% of the budget. One recommendation was to fund a project to drive the uptake of Telehealth and therefore reduce travel. Over the 15 months of the project period \$1.1million in travel costs were avoided. This also included not having to pay for escorts and for people who were booked but did not attend. We have many Indigenous communities and Telehealth has helped to provide culturally appropriate care and discussions. The use of Telehealth has helped streamline our patients journey through the health care system. Patients can access their Specialist care without unnecessary travel. If travel becomes necessary for treatment this can be explained and worked out with the patient beforehand so everyone know what is happening and why. This leads to better engagement and attendance. Patients who need follow up appointments following surgery or hospital admissions are routinely asked to come back to the hospital for that appointment. We have changed the way we do business by offering Telehealth appointments where clinically appropriate. Clinicians at the patient end can see and hear what their patients care involves including medication changes in real time, without the delay of waiting for a letter to arrive with the details. Patient satisfaction was the best outcome for the project with an overwhelming 96% of people using the service stating they would like to have further consults via Telehealth.

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Using telehealthcare for integrated community nursing care of older people.

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2. Selwyn Foundation, New Zealand

AIM

To explore the efficiency of providing a community nursing service via telehealthcare for older people with long term health issues.

METHODS

Twenty patients with long term health issues, their five doctors, and two telehealthcare nurses, participated. The telehealthcare service was provided by an urban non-government aged care facility. Patients completed before and after questionnaires, conducted daily monitoring activities, and participated in exit interviews. Health data were reviewed by the nurses, who had regular short videoconference calls with patients. Nurses kept field notes. Doctors completed questionnaires.

RESULTS

Participants (patients) were mostly women, aged 61 to 90, using the service between 80 and 139 days (average), some used it for 8 days and others up to 156. Twenty participants had 54 health issues (co-morbidities), and all lived at home (12 alone). 81 devices were installed in 20 homes (pulse-oximeter, thermometer, weighing scales, blood pressure device, and tablet to answer questions and conduct videoconferences with the telehealthcare nurse). Reasons for using the service included transition from hospital to home, and other concerns about health issues, e.g. stabilising blood pressure with medication and daily monitoring. Hospitalisations, and visits to GP and specialist decreased while using the service. General sense of wellbeing improved. Participants learned how to make timely appointments with their doctors. Self-reported pain reduced. Energy levels, social interactivity ('I was hiding before'), and ability to do activities improved. Participants felt competent to take charge of their health when discharged from the service. Doctors were satisfied subject to certain criteria, e.g. reason and acuity of patient using the service. Participants valued the service highly and would recommend it to others.

CONCLUSION

General nurses provided care via telehealthcare technologies, built caring relationships with patients, and coordinated and integrated their care effectively. Patients achieved better health and a sense of control over their health issue.

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Treating preventable blindness through Telehealth

Lyndall DE MARCO ¹

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AIM

Prevent vision loss and preventable blindness in Aboriginal and Torres Strait Islander people with diabetes.

METHODS

Don't be blinded by diabetes – use telehealth. Over the age of 40 years, Aboriginal and Torres Strait Islander people have six times the rate of blindness of other Australians. Diabetes is the major cause of diabetic retinopathy. 94% of vision loss in Indigenous Australians is preventable or treatable. The tyranny of distance prevents early intervention. The IDEAS Initiative is a world first and commenced operations in March 2014. It aims to prevent blindness from diabetes in rural and remote communities. The IDEAS model diagnoses a patient for an eye condition through a tele-health model that minimises travel, time and expense to access quality eye health treatment in familiar cultural surrounds of their own community. The IDEAS Van is a 19 metre state of the art ophthalmic treatment centre staffed by local and visiting ophthalmologist, optometrists and orthoptists who donate their time. The Van consists of an optometry room, a diagnostic zone and ophthalmic treatment room. Those who need treatment travel to 15 rural and remote hubs that are visited on a regular basis. To date 2003 patients have been referred for treatment on the Van. Access to the IDEAS Van is by GP referral from the local medical service who manage the patient's diabetes care. Patients are pre-screened with the non-mydratic camera by trained health workers. Retinal images are graded by Professor Paul Mitchell at Sydney's Westmead Hospital. Based on a grading report, an appointment is scheduled for further investigation or treatment on the IDEAS Van. 3,697 patients have been screened from 51 communities. An Endocrinology Telehealth service provides weekly consults through Dr Tony Russell at Princess Alexandra Hospital to Aboriginal Medical Services working closely with the chronic disease nurses building their capacity to deliver enhanced diabetes care including an annual retinal scan. Working with most sensitive equipment and having travelled 150,000kms the IDEAS model challenges the traditional world of ophthalmology but the results have silenced the sceptics. www.ideasvan.org

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Design of an RCT to compare the effectiveness of smartphone and paper-based delivery of a mixed methods intervention for adolescents with type 1 diabetes.

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The disease burden of Type 1 Diabetes Mellitus (T1DM) is continuing to grow in Australia. Management of T1DM is a challenge, particularly during adolescence, because of the complicated disease self-management required. Many behavioural, educational, and supportive interventions have been trialled to address this issue, with varying degrees of success. Smartphones have the potential to improve access to and the effectiveness of these interventions by delivering them in an ongoing, non-intrusive and cost-effective way. Furthermore, the use of gamification as a way of designing mobile applications is gaining popularity but is yet to be well evaluated by the literature. Trials of smartphone-based interventions for adolescents with T1DM have only assessed the impact on clinical outcomes to care as usual. Although a small number of these studies showed encouraging results, it is unknown if the improvement was due to the new intervention or that this intervention was delivered using mobile technology. If these applications, or gamified smartphone applications, are to be used as a delivery platform for interventions, then it is important to demonstrate their efficacy over traditional methods. We have proposed a randomized controlled trial to compare the effectiveness of an intervention for T1DM when delivered using a smartphone to when delivered on paper. A total of 87 patients with T1DM aged 10-24 will be randomized into one of two smartphone or control groups. Participants in the control group will receive a mixed diabetes education and logbook intervention by post. The two application groups will receive the same intervention within an Android application, with one group receiving a gamified version. The primary outcome measure will be HbA1c at 6 months. Secondary outcome measures will include other measures of glycemic control, adherence, diabetes knowledge, health related quality of life, and feasibility. Results of this proposed study will provide evidence of the reliability of smartphone applications to deliver interventions to adolescents with T1DM. To our knowledge, this is the first properly-controlled double-blind randomized control trial to assess the use of smartphone applications in a healthcare setting.

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TeleHealth Model of Care in Urban Indigenous Health Services in South East Queensland.

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The Institute for Urban Indigenous Health (IUIH) leads the planning, development and delivery of comprehensive primary health care services to the Indigenous population of South East Queensland (SEQ)[i], including allied health, child and maternal services, preventative health and clinical services. In 2013 IUIH implemented a telehealth program across 18 Aboriginal Medical Services (AMS) to improve urban Indigenous clients' access to specialist clinical services, including tele-psychiatry, tele-endocrinology, tele-neurology, amongst 20 other specialities.

The IUIH Telehealth model of care is based on the ACRRM telehealth standards[ii] and NACCHO[iii] telehealth guidelines to provide evidence based, ethical and culturally appropriate health service delivery to over 27740 patients. The model optimises use of locally available resources to build telehealth appropriate services for 18 AMS's across SEQ. Barriers to adaption of telehealth such as IT support[iv], staff training and buy in, access to telehealth specialists, were identified early on and a strategic approach to overcome these barriers was used- IT team at each clinic, along with lead clinicians, nurses and health workers were involved in planning and development of the model. Telehealth champions were identified and trained at each clinic. As is known for long term sustainability of any telehealth program, it needs to be integrated into day to day clinical activities[v]. Today out of the 18 clinics, 12 clinics use telehealth and bill Medicare routinely. The regional eHealth coordinator plays an important role in continuous quality improvement, providing access to specialists and development of the program by managing change and providing ongoing support to the clinics[vi].

The IUIH Telehealth Model is contributing to evidence re: use of telehealth in urban areas for highly disadvantaged Indigenous population, by improving access to specialist services in a culturally appropriate and clinically safe environment. The model also supports Australian government's telehealth ruling for AMS's to access telehealth irrespective of their location. Even with exiting specialist visits and closeness to hospitals, telehealth has its place for servicing the Urban Indigenous Population of SEQ.

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User acceptance of an innovative mobile health enhanced delivery of insulin initiation and titration program for patients with type 2 diabetes.

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AIM

For patients with complex diabetes, clinical insulin initiation and titration (IIT) program is essential to effectively and safely use insulin to control blood glucose levels (BGL). However, traditional telephone and/or visit based program is highly resource-intensive for clinicians, and difficult for patients to adhere. To overcome this, an innovative mobile health system was recently developed to enhance the delivery of IIT program. The system consists of an Android smartphone application, wireless blood glucose meter (Accu-Chek® Connect, Indiana, USA), and clinicians' portal. The aim of this study is to evaluate user acceptance of the system through a pilot clinical trial.

METHODS Stable patients (n=10) with type 2 diabetes on insulin were recruited. Following consent, patients used the smartphone application with the glucose meter to record BGL, insulin dosages, and self-observation notes for a one-week period. Finally, a questionnaire was used to evaluate their acceptance, scored as 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly Agree.

RESULTS

Nine patients completed the trial, aged 58±14 years (Mean±SD) with HbA1c of 8.6±2.9% (Mean±SD). On average, each patient recorded 3.0 BGL entries and 1.3 insulin entries per day. The patients found that the glucose meter and smartphone application were easy to use, with an average acceptance score (ACC) of 4.2, and preferred to continue using them (ACC=4.2). Additionally, patients found advices and instructions from the application important (ACC=4.4), and were confident to use the application to manage their diabetes (ACC=4.3). Overall, they were satisfied with the system (ACC=4.3), and found the time frame to record data entries in the program acceptable (ACC=4.3), despite some technical issues during the trial (ACC=3.3).

CONCLUSION

The results demonstrate that the mobile health enhanced delivery of IIT program was an accepted approach to diabetic patients, and hence, support further studies of new delivery models using mobile health solutions to improve the effectiveness and efficiency of traditional IIT program.

REFERENCES (optional) This study received ethical approval from Metro South Human Research Ethics Committee (Ref: HREC/14/QPAH/686)

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Telehealth service models for Australian general practices.

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AIM

In Australia, there is growing interest in using telehealth for provider-to-patient consultations in general practice (GP). However, in the absence of Medicare funding, GP telehealth services have been designed and implemented by telehealth champions and entrepreneurs using novel service models. Examination of these service models is warranted, as they may provide an indication of a patient's willingness to pay and the sustainability of telehealth. To date, little has been published on user pays service models. The aim of this study was to identify and describe service models which are currently used in Australia to provide GP consultations via telehealth.

METHODS

We examined the service model used by a convenient sample of primary care telehealth services providers. Telehealth providers were identified through the Internet and grey literature searches. We undertook analysis and coding of the content of documentation from the provider (e.g. web site, patient information sheets, FAQ) related to service models.

RESULTS

We identified four categories of service models for GP telehealth services based on similarities and differences between the examined service models. These four categories are: 1) After-hour telehealth services which aim to provide care to primary care to patients when their regular GP surgeries are closed; 2) Supplementary telehealth service provision which aims transforming "regular" GPs into telehealth-enabled service providers; 3) Substitution service model which aims to provide a convenient alternative to face-to-face GP consultation often by independent practitioner and 4) Hybrid model, which is a combination of telehealth-enabled services for primary care.

CONCLUSION

Some of the identified categories of service models are intended to complement or enhance general practice services provided by the patient's regular general practitioner. Whereas, other identified categories aim of substituting care provided by the regular general practitioner. These services attract patients with the benefits of convenience, lower cost or anonymity.

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MyOnlineClinic: A novel mobile App for telemedicine.

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AIM

MyOnlineClinic (MOC) is a Telemedicine platform which provides access to primary care and general practice to Australian patients. It is designed to improve access to primary care for the patients who find distance, mobility, or travel cost as a barrier. MOC enables patients to connect to their regular General practitioner (GP) as well as other GPs using information and communications technology. The aim of this presentation is to demonstrate the functionalities of the system, describe the service model, and report the up-to-date usage status of the system by Australian patients and GPs.

METHODS

MOC is mobile-based platform that has been developed by Telemedicine Australia Pty Ltd with support from the University of NSW and NSW Trade & Investment. It uses the latest video technology, Bluetooth devices and file-sharing solutions without the need for any additional software, to connect patients to GPs, pharmacies, pathologies and radiologies. Under MOC, the initial consults are initiated via phone call or request enquiry, which is handled by a medical receptionist, the call is triaged which is followed by an online account creation and consultation booking. During repeat consults, the patient uses the app to find a doctor and book a consultation, the doctor will be able to access past history, live diagnostic data during the consult.

RESULTS

MOC makes it possible for patients to use their own desktop computer, laptop, tablet, or smart-phone to make an appointment with a doctor, have video-consultation with the doctor and receive clinical advice, have their prescription sent to their local pharmacy and pay for the consultation online. MyOnlineClinic enables patients to collect their medical data such as temperature, blood pressure and blood glucose and communicate that information to their doctors. Doctors who use MOC can benefit from working remotely while being away from their clinic or surgery. This platform allows them to take care of their patients' remotely as well as visit new patients who are seeking medical services.

CONCLUSION

MyOnlineClinic exhibits a novel telemedicine service and business model that can efficiently connect patients to GPs, and improve access to primary medical care for Australians.

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Achieving Videoconference Interconnectivity in New Zealand.

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2. Wellsouth PHO, New Zealand

Clinical telemedicine in New Zealand has matured from what was essentially a single vendor network using hardware endpoints within secondary care, to multiple vendors operating hardware, software, and web based endpoints throughout primary and secondary care, and into patient homes. The downside of this progress has been the emergence of a lack of across network interconnectivity as a barrier to some consultations. The approach to this problem over the last three years has included the development of interoperability and endpoint naming standards, a centralised directory for health related VC endpoints, and interconnect rules. All together these should make the experience of the end user simple and reliable, and agnostic of vendor, network or device. We will describe the roles played by the Ministry of Health, the New Zealand Telehealth Forum, vendors, purchasers, and end users. While a great deal of progress has been made towards our goal of seamless interconnectivity, we are not there yet, and we will try and explain why this is the case. In doing so we hope to provide a roadmap for others who are considering getting interconnected.

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A mixed-methods enquiry into Telehealth support of a nurse practitioner managing emergency patients in a remote community. A 'natural experiment' design examining effects of case retention, transfer and practitioner experience using numerical and interview data.

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AIM

To examine the effect of a Nurse Practitioner's (NP) use of TEMSU (Telehealth Emergency Management Support Unit, a 24 hour-a-day video-conference (VC) specialist emergency clinical support service) in a remote community on rates of acute retrieval (Retrieval Services Queensland transfer), or retention of cases in the community.

METHODS

Design: Retrospective audit / observational natural experiment. Time period: two years (FY 2014-16), the intervention period being 4 months mid 2015/16. Setting: a Queensland remote community with a population of 8000 in the Mackay Hospital and Health Service (MHHS) district. Measures: background use of RSQ and TEMSU for MHHS in the years as a whole, and in the intervention period in the community; proportionate use of TEMSU and RSQ by the Nurse Practitioner; evaluation of cases retained after TEMSU use, by expert review of case descriptor and telehealth operator notes. Exclusions: cases where no videoconference occurred; mass-casualty situations.

RESULTS

39 TEMSU case-calls were recorded in the intervention period (approx. 10 per month), all by the NP. 6 were ultimately not completed as videoconferences (exclusions). 33 completed VC case-calls were made by the NP. 19 of the 33 cases (57.6%) were not transferred acutely by air, but retained and managed in the community. 18 were able to be assessed. 12 of the 18 retained cases (66.7%) would probably have been transferred by air if TEMSU had not been available. There were 33 acute aerial transfers from the community in the intervention period compared to 18 for the same period the previous year. Cases for which aerial transfer was avoided represented a 26% reduction in total possible retrievals in the intervention period, and cost-savings of approximately \$AUD120 000 over four months, or \$AUD360 000 per year from this single community.

CONCLUSION

The TEMSU system allowed the NP to obtain clinical support from Emergency Medicine and Paediatric specialists during a period of high case activity and acuity. Acute transfers were reduced. Risks related to mode of transport were therefore reduced. Cost savings were demonstrated. These results are generalizable to the rest of the MHHS, and potentially to similar services elsewhere.

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Telecare Implementation for Elderly Population Residing in Skilled Nursing Homes in Taiwan.

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AIM

Population aging is pervasive, and it is a global phenomenon affecting almost every country in the world. Rising of healthcare costs and shortage of healthcare providers have been emerging as crucial issues in many societies as well. Hsiao Chung-Cheng Hospital in New Taipei City, Taiwan, teamed up with several regional hospitals to initiate an alliance to address the issues; utilizing healthcare information technology, Telecare, via Tele-consultation, Tele-physiological Monitoring, Tele-visit, Tele-health education, and Tele-medication safety, to assist elderly residents in skilled nursing homes in pursuit of better healthcare, and to improve quality of life. After six years of Telecare implementation and data/outcomes analysis, significant results were achieved, including reduced re-admission rates to hospitals/ER, lower nursing homes' nosocomial infection rates, and decrease of adverse drug reaction events. In addition, health awareness for nursing homes' care providers was emphasized throughout the implementation period, nutrition and chronic disease managements were also greatly improved. As of May 2016, more than 1,300 elderly residents in forty skilled nursing homes from five different counties participated in the institutional-care model Telecare, many institutions were located in remote and distanced districts, some were even isolated in mountain regions and seashore belts.

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Exploring patient's experience and perspective of a heart failure telerehabilitation program: A mixed method approach.

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AIM

There is currently limited information exploring patient experiences with heart failure (HF) telerehabilitation programs. Patient feedback and end-user perceptions provide important information regarding the acceptability of this new delivery model. We aimed to describe the experiences and perspectives of patients who had participated in a new HF telerehabilitation program.

METHODS

The telerehabilitation program consisted of a 12-week, real-time, exercise and education intervention delivered into the patient's home twice-weekly, using an online videoconferencing software (Adobe Connect 9.2) to enable group interaction. Inclusion criteria were those who had attended at least two telerehabilitation sessions. We adopted a mixed-methods approach at program completion: self-reported surveys with visual analogue scales (/10) regarding audiovisual clarity, ease of use of computer and monitoring equipment, and preferred delivery model; and semi-structured face-to-face interviews to explore patient experiences and perceptions related to the telerehabilitation program. Interviews were transcribed and coded, with thematic analysis undertaken.

RESULTS

Seventeen participants (mean age [SD] of 69 [11] years, 88% males and mean travel time to the hospital of 30 minutes) were recruited. The mean (SD) audio and visual clarity scores were 7 (2.8) and 9.1 (1.6) respectively; and ease of use of computer and monitoring equipment were 7.8 (3.1) and 9.3 (1.1) respectively. The majority of participants preferred a combined face-to-face and online delivery model. Major themes from the interviews included motivating and inhibiting factors related to telerehabilitation and suggestions for improvements. Participants liked the health benefits, improved access with reduced transportation, and social support whilst maintaining personal space. Participants highlighted a need for improved audio clarity and connectivity as well computer up-skilling for those with limited computer experience.

CONCLUSION

Participants in this HF telerehabilitation program reported high visual clarity and ease-of-use, but provided suggestions for further improvements. Information on patient experiences and perceptions of telerehabilitation can help to facilitate future uptake and success of this delivery approach.

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Telehealth - exploring how nurses manage patient safety and risk management in New Zealand.

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Currently the delivery of the New Zealand health service is being greatly challenged. Issues such as increasing cases in chronic conditions to be managed, both a population and health professional workforce which is aging, a shrinking health dollar and a consumer who has increasing expectations of the health system are a few of the visible challenges being grappled with. Increasingly telehealth is being seen as a partial answer to the ever increasing demand on the service. New Zealand with its remote areas requiring many miles of travel to reach a destination is ideal for providing a service through telehealth. This paper will explore how patient safety and risk management of clinical practice, by New Zealand nurses, using telehealth, is being handled. It does not promise to provide all the answers. Its purpose is to encourage further international discussions around patient safety and risk management when using telehealth to keep both nurses and patients safe.

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A local experience of how telehealth changed the role of rural renal nursing.

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AIM

To ascertain how telehealth changed the role of Rural Renal Nurses (RRNs).

METHODS

Our local satellite dialysis units' geographic isolation from the main renal unit increases the vulnerability of their RRNs. They also often miss out on education and service development opportunities. The recent introduction of telehealth may help bridge this professional inequality gap. Since 2014, telehealth was gradually introduced, starting with virtual video clinics; the physician from the hub would video link with patients and nurses at the satellite unit. These RRNs (highly trained and often with extra professional qualifications) performed patient observations, medications reconciliations, document-filling, fluid assessments and examinations. Gradually, other virtual consultation modalities were introduced: blood result reviews, dialysis rounds, impromptu clinical assessments, patient-family-doctor meetings, dietetics, pre-dialysis counselling and transplant work-ups. Their smooth implementations required crucial RRNs participation. The same virtual links were used to facilitate virtual meetings and education sessions with the hub and other satellite units. Patients were also given questionnaires about the video clinics.

RESULTS

Telehealth provided local RRNs with an excellent unique platform for professional development; with up-skilling in both clinical and computer knowledge. The increased clinician interaction with more opportunities for attending education sessions provided invaluable training. Flexible clinician access through video consults also reduced the vulnerability of isolation. The increased chances of attending service development virtual meetings meant better engagement with the central hub. All these came with minimal work schedule disruption and without unnecessary travel, resulting in efficacious use of nursing time. There were also significant cost and time savings with carbon footprint reduction. Patient feedback was excellent.

CONCLUSION

The use of telehealth has expanded the role of our RRNs, reduced their vulnerability to isolation and bridged the gap towards providing equal opportunities for education and service/professional development. This has empowered our RRNs to operate semi-autonomously. Future plans include developing the nurse-practitioner role.

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Teleradiology in Emergencies: A review of Mobile Teleradiological Applications and Frameworks

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AIM

Medical/healthcare emergencies are increasing worldwide. With the rapid development of mobile technologies in which required information can easily be delivered to the point of care especially at emergencies, Teleradiology is gaining its popularity. Today, apart from using the conventional audio-visual communications, radiological medical images can also be viewed remotely. However, issues of such systems like privacy, security, and lack of user friendliness are still a major challenge. The main aim of this study is to identify the privacy, security, and the collaborative requirements to establish a mobile-based collaborative teleradiological medical imaging system in Sri Lanka.

METHODS

A search of electronic databases including Pubmed, Medline, CINAHL, AMED, DynaMed Plus, and MedicLatina for relevant papers was performed. All studies addressing the use of teleradiology in emergency medical care and eHealth and mHealth security and privacy issues were included.

RESULTS

Out of 468 articles retrieved, 36 articles, which met the inclusion criteria, were subjected to final analysis. Most useful collaborative features and most common security and privacy issues of such eHealth and mHealth systems were identified. Although, a majority of studies showed that the Teleradiology over mobile devices had made a positive impact on emergency medical care, a considerable number of articles highlighted certain significant negative aspects of eHealth and mHealth which mainly fallen on privacy and security issues. Evidences are emerging not only successes of improving the accuracy of the diagnostics, but also improving the quality of the treatment in emergencies and extending the specialist services to the rural and remote areas.

CONCLUSION

Teleradiological systems can be used with computer driven pattern discovery techniques such as Datamining to automatically extract hidden patterns in large medical data repositories. However, regulatory frameworks such as Health Level-7 (HL7) and Health Insurance Portability and Accountability Act (HIPAA) should make its adherence to facilitate the interoperability with the other electronic health care services when ensuring the privacy and the security of sensitive medical data.

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Telehealth in Pain Management: The Gateway to Primary Care.

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AIM

Chronic pain affects 20% of the population, however access to multidisciplinary specialist pain clinics is difficult in Australia. Chronic pain is often managed by general practitioners (GPs), where funding models, knowledge and skills prove barriers to effective management. Where this is the case, opioids¹ provide a ready, but ineffective solution. With new technology in video conferencing available, it is possible to provide specialist support to GPs enabling a holistic approach, focusing on self-management, non-pharmacological interventions.

METHODS

A pilot model using videoconferencing to General Practice was undertaken at two NSW pain clinics to assess the effectiveness in providing support to GPs and their patients in multidisciplinary pain management. Healthdirect Australia's video call@ (HDA) was used to deliver secure videoconferencing directly to the patient in the GP practice, or in their own home, via desktop computers. Training and implementation support was provided by ACI along with a chronic pain toolkit developed to address the clinical, technical and financial implications of using HDA technology.

RESULTS

Over six months, 32 sessions were conducted, resulting in a saving of 9000kms of patient travel. Only two of the 32 sessions experienced unresolved technical difficulties. Compliance with telehealth standards occurred 100% of the time. The model has now been implemented in eight pain clinics, with several more on a wait list. All patients reported that they were satisfied with the modality. All specialist clinicians and GPs were satisfied with the modality. Six GPs subsequently referred additional patients indicating a positive experience.

CONCLUSION

Telehealth supported by implementation and clinical support, is an effective way to assist GPs in delivering evidence based pain management strategies. This model has now been implemented across a further five pain clinics across with a further eight on the waiting list, with the hope that 17/21 pain clinics in NSW will have implemented this model.

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Integrating telehealth in to 'business as usual' - is it really possible?

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AIM

The Royal Children's Hospital (RCH, Melbourne) mantra has always been that 'telehealth is just another way of delivering services', and should be embedded as 'business as usual'. It is apparent, four years later, that there are differences in certain aspects of the processes and that this goal has not yet been achieved. The RCH remains committed to telehealth and has been considering ways to maximise uptake as efficiently as possible. The aim of this presentation is to share lessons and experiences in attempting to embed web-based telehealth in the day-to-day roles and processes of a busy Specialist Clinics.

METHODS

Earlier in 2016, a detailed one-month audit of all telehealth consultations highlighted many small gaps in process that can impact on the successful completion of a telehealth consultation. Working forward from a booking and then backwards from billed consultations, gaps between booking and billing were identified. This was reviewed to look at potential trends with view to improving the successful delivery of telehealth.

RESULTS

Of the 107 booked appointments, 19% did not take place (failed, rescheduled or cancelled) and 17% were completely seamless. Of the 79 appointments that actually took place, 39% were billed to Medicare, 23% were 'public' and 38% reflected potential but missed billing. Some issues should be resolved through the recent introduction of an Electronic Medical Record (such as registered attendance or Item numbers for billing); some require staff training (for example the nuances of scheduling with regional clinicians) and some reflect patterns for all Specialist Clinics activity (including the proportion of rescheduling or non-attendance).

CONCLUSION

Telehealth is still difficult to seamlessly embed in to 'business as usual' in a busy health service. Clear, documented processes are required; all relevant staff need to be competent in these processes and, processes need to be unchanged. This is difficult to implement in the context of an ever changing environment - for example with staff turnover, evolving telehealth technology and the introduction of new hospital IT systems or other processes that may impact on telehealth.

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Telemedicine for acute care and transfer decision making: preliminary experiences in Northland, New Zealand.

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AIM

Northland District Health Board in collaboration with the University of Queensland is conducting a two-year trial of the use of telemedicine for acute advice and transfer decision making. This trial links clinicians at Kaitaia Hospital in the North of New Zealand with intensive care clinicians at Whangarei Hospital. This trial is the first of its kind in this setting and case mix. Aim: to audit experiences of the first year of use (6 months run-in and 6 months routine operation).

METHODS

Descriptive quality assurance audit.

RESULTS

Telemedicine was used to manage 25 retrieval cases. Data for advice-only use of telemedicine were not recorded. Median call duration was 10 minutes (range 5-20). Changes in anticipated transfer category occurred in 4 (16%) of cases (2 downgrades, 1 upgrade and 1 cancellation). Change in acute management at Kaitaia resulting from the use of telemedicine was recorded for 8 (32%) of cases. In 18 (72%) of cases, ICU clinicians recorded that using telemedicine added to the advice that they were able to provide. Clinicians perceptions of the effect of telemedicine on the quality of care were recorded for 16 cases at Kaitaia (10 positive; 6 insignificant) and 17 cases at Whangarei (12 positive; 5 insignificant). No negative reports relating to quality of care were recorded.

CONCLUSION

Results suggest that the use of telemedicine has a positive effect on both transfer decision making and on acute management, with no reported concerns regarding quality of care.

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Patient's Symptoms and Telehome Monitoring-based Telenursing System for COPD, ALS and DM (CAD) Patients

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AIM

The number of older adults with chronic obstructive pulmonary disease (COPD), amyotrophic lateral sclerosis (ALS) and diabetes mellitus (DM) CAD is increasing, particularly in the super-aged population in Japan. We developed telehome monitoring-based telenursing (THMTN) system for patients with CAD. This study aimed to evaluate correlation differences between CAD patients' physical data and subjective symptoms, over a 3-month period. Physical and mental data were transmitted once daily from home equipment, such as a tablet personal computer (TPC), to the monitoring centre. The THMTN system was adapted to individual patients and operated by them.

METHODS

The THMTN system comprised a 22-item physical and mental status self-assessment, including self-reporting and management of the equipment (manometer, pulse oximeter, and bath scale with Bluetooth wireless system) that automatically sends data to the TPC. CAD patients adopted the system for a 3-month-monitoring period. Multiple regression analysis was used for statistical data analysis.

RESULTS

The system was trialled on 31 patients (22 COPD, four ALS and five DM patients, with mean ages 76, 62 and 75 years, respectively and 2540, 426 and 678 days of monitoring, respectively). Oxygen saturation (SpO₂), pulse, blood pressure, body temperature, peak flow, Borg scale score and number of walking steps were significantly different among CAD patients. Patients' subjective daily status (rated 0-10 points) was significantly related to appetite, physical pain, Borg scale score and cough in COPD patients; appetite and sputum production in ALS patients and sleep, mobility and physical pain in DM patients.

CONCLUSION

The correlation of patients' physical and self-reported symptoms on subjective daily status differed in CAD patients across the disease groups.

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Patient's Symptoms and Telehome Monitoring-based Telenursing System for COPD, ALS, and DM (CAD) Patients

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A Study on a Method of Telenursing Support for the Elderly with Type II Diabetes Mellitus; Based on Trial Administration in Four patients.

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AIM

In Japan, the population is aging rapidly, and the diabetes cases have reached 10 million, with 90% cases being type II diabetes mellitus (T2DM). Although diet, exercise, and anti-diabetics are essential for disease control, many therapies are contraindicated in the elderly. We developed an at-home monitoring based telenursing support that allows patients to perceive their own health condition, and maintain appropriate exercise and diet. We report a trial administration of this system to four elderly T2DM patients.

METHODS

The telenursing support was administered to four consecutive T2DM outpatients (≥ 65 years) for three months. The subjects recorded blood pressure, body weight, and number of steps, once a day. Nursing instruction was provided at the beginning and two months after initiation, to share and assess target treatment; and upon activation of trigger.

RESULTS

The mean age, HbA1c value, and body mass index at initiation were 74.25 years, 8.03%, and 23.8, respectively. In the four patients, remote nursing instructions were provided 17, 11, 4, and 8 times, respectively, and included ways to treat physical symptoms like lower-limb oedema, consultation about drugs, sharing target treatment (5000-10,000 steps daily and avoiding between-meal snacks), and equipment operation. Body weight decreased by ~2.57 kg in 3 months; however, no changes in HbA1c values were observed. At the completion of trial, the patients reported that the system resulted in: maintenance of target therapy, including ~30 minutes of daily walks, by conversation with telenurses; increased diet and therapy awareness; no hypoglycaemia; and increased awareness of physical conditions.

CONCLUSION

In the elderly T2DM patients, self-monitoring and remote nursing promoted better self-perception of health and increased awareness regarding appropriate exercise, diet, and drugs, which may lead to a healthier lifestyle. In future, we will improve the operability, and enhance the remote nursing instruction by including additional message switching functions.

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Educating health professionals for telehealth: the centrality of digital literacy.

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AIM

Current and future success or failure of telehealth is predicated on the capability of the health workforce. Evidence indicates that digital literacy capability is low amongst health science graduates, rendering them ill-equipped to work or innovate in a health system driven by telehealth usage and innovation. The aim of this project was to develop a digital literacy framework and an e-health mapping tool. A secondary aim was to build a digital literacy website to disseminate project outcomes.

METHODS

Interviews with telehealth experts were conducted, with Belshaw's (2011) eight elements of a digitally literate individual used to guide analysis. This process led to a contextualised digital literacy thematic framework that reflected the capabilities required of health science graduates. Overall and level descriptors for basic, medium and advanced capabilities were developed. The framework was used as the basis for a mapping tool that could be applied to a health science curriculum to identify digital literacy capabilities.

RESULTS

The developed framework comprised six themes: creating understandings, developing the culture, using the full capacity, building connections, owning the space and transformative thinking. The validity of the framework was tested by applying the mapping tool to a health science curriculum. This application was represented visually in a grid. Using this grid, we were able to map and document digital literacy development across four years of an undergraduate degree.

CONCLUSION

We confirmed the centrality of digital literacies beyond proficiency with Information Communication Technologies. Our developed framework and the practical application of this in mapping educational programs makes explicit the extent to which digital literacies must be interwoven in undergraduate curricula. By using our developed materials, educators can be supported to explicitly embed multiple learning and teaching opportunities to build the capabilities fundamental for telehealth in contemporary and future healthcare.

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A new model of care for management of patients with viral hepatitis: the use of Telehealth to manage chronic hepatitis C infection in regional Queensland.

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AIM

Liver disease represents a growing health burden in Australia. Chronic infection with viral hepatitis B (HBV) and C (HCV) are major drivers, causing cirrhosis, decompensated liver disease and hepatocellular carcinoma. Though HCV treatment may prevent progression, uptake has been low. Access to specialist prescribers for regionally located patients has been a major limitation. The Central Queensland Liver Clinic (CQLC), based in Rockhampton, initiated a team-based telehealth model to expand regional chronic viral hepatitis management. The clinic services 22 outreach sites state-wide, covering an area of over one million square kilometres. Nursing staff play a fundamental role, taking baseline history and liver fibrosis assessment and link patients and GPs to specialists using three-way telehealth bridges to sites.

METHODS

A retrospective audit of the introduction and expansion of hepatology telehealth compares consultations from July-June 2014-15 (pre-expansion) with 2015-16 (post expansion). Interviews with selected service staff were also conducted to determine factors contributing to success of the service and identify potential barriers to expansion of the program.

RESULTS

A greater than fourfold expansion in clinical consultation was observed with expansion of the telehealth clinic (131 telehealth consultations for 14-15, compared with 572 in 15-16). Despite increased consultations, the failure to attend (FTA) rate decreased (13.0% vs 6.5%, 14-15 vs 15-16 respectively), suggesting engagement with the service increased. Staff identified successful elements as; 1. Nurse conducted primary assessment prior to specialist consultation, and 2. Personalised schedules including treatment milestone dates and investigation schedules. Ongoing obstacles were technological, principally inadequate access to telehealth connectivity and equipment in GP practices, with patients consequently relying on regional hospital facilities.

CONCLUSION

This integrated team approach appears to streamline telehealth complex disease management. Barriers persist in connectivity with GP practices, and extension of telehealth services into GP practices beyond health department infrastructure. More flexible delivery networks may enhance uptake further.

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Development of a South Island Regional Telehealth Strategy.

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AIM

The strategy aims to provide centralised governance, standardisation and scalability across the South Island region telehealth services. The goal is to support the increasing use of telehealth and mobile health solutions in the clinical setting with the following outcomes: More equitable access to health care that is cost neutral or cost savings, Improved quality of service provision, Improved skills and knowledge of staff through cheaper and easier access to education, Improved patient access to their own health information via the patient portal with a more complete health record.

METHODS

A review of international and New Zealand regional ehealth and Telehealth strategies and maturity frameworks, consultation with regional stakeholders, and a recent current state analysis contributed to the strategy.

RESULTS

The strategy closely aligns with the revised National Health Strategy. There are five areas of focus, one being 'Closer to Home'. This focus specifically refers to telehealth services as a means to providing services. The strategy also aligns with the goals of the South Island Alliance. The South Island Alliance is the collaboration between the five South Island DHBs. Its vision under the Best for People, best for System framework is for a sustainable South Island Health System focused on keeping people well and providing equitable and timely access to safe, effective, high-quality services, as close to people's homes as possible. The National Health IT Board announced in 2015 that they will be using the HIMMS IT Maturity Model to assess progress of eHealth solution implementations in DHBs. An aligned Telehealth Maturity Model has been developed. The strategy will use the model to guide progress towards a more mature environment. Interventions are required to increase the uptake of Telehealth throughout the South Island. The HIMSS Telehealth Maturity Model provides details on where to prioritise work, starting with the centralised management of a Telehealth service.

CONCLUSION

Varying current states and competing resources will impact on the ability to implement the strategy within the proposed five years. A review is scheduled for one year to assess progress and the potential for impacting new technologies.

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Telehealth applications for chronic disease recovery and practitioner CPD training.

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AIM

This report shares four avenues of telehealth employed for chronic disease management and practitioner CPD training:

CLINICAL CONSULTATIONS

Since 2009 clinical consultations have been conducted nationally and internationally via phone and skype, with email support in between sessions, for patients with chronic fatigue syndrome, Myalgic Encephalopathy, fibromyalgia, post viral fatigue, adrenal fatigue, Irritable Bowel Syndrome, anxiety, depression and related conditions. Consultations have been conducted with patients based in New Zealand, Fiji, Australia, India, Singapore, UK, Spain, Germany, Canada and USA, and virtually from the UK, USA, Thailand, Australia and New Zealand. 90% of patients who implement the protocol have experienced between a 50% and 100% recovery rate.

ONLINE SUMMIT

In 2011 an online international multi-speaker chronic fatigue and fibromyalgia summit was delivered, receiving excellent feedback from attendees, and being nominated for a Waitemata DHB Health Excellence Award in 2012.

CPD TRAINING

Since 2014 CPD training for practitioners has been run remotely between New Zealand, UK and Australia. Meetings are recorded on Zoom meeting software and uploaded into a private practitioner portal for ongoing reviewing. Practitioners report the delivery format as highly convenient.

SELF-HELP PROGRAMS

Since 2015 online self-help programs teaching recovery from chronic pain and fatigue conditions have been offered via an easy-to-use online membership portal with 24/7 access from anywhere in the world from most digital devices including mobile phones. Lessons are delivered via pre-recorded videos, downloadable MP3s and PDF handouts. Programs come with an option of private online forum support and monthly group webinars. A June 2016 survey showed symptoms for members as a whole reduced from a mean rating of 7-10/10 to 0-5/10. An 88-year-old Australian woman with 55 years of debilitating symptoms rated depression 9-10/10 and fatigue 8/10 before starting the program, and 6 months later rated depression 0/10 and fatigue 2/10.

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State of the Region: Are we doing it right?

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AIM

With a large geographical area and a low population, the District Health Board is predominantly a rural health service. Telehealth is commonly viewed as an enabler to reduce inequities in health service delivery in these areas. This Health Board's vision is to centre carefully around the patient. With this in mind, this work aims to consider the benefits of telehealth in terms of the patient. The purpose of this programme is to assess the value of telehealth programmes in terms of costs and benefits to the patient, patient outcomes and the value proposition for the Health Board in utilising telehealth. The development of meaningful metrics and evaluation criteria against which telehealth activity may be evaluated and benchmarked within a service, across different Health Boards and internationally remains an evolving field of work.

METHODS

In consultation with Business Analysts, Telehealth Program Managers, Ministry of Health representatives and consumers, telehealth activity metrics have been developed for the Health Board's telehealth programme analysis, with the possibility of adoption across other Health Boards in New Zealand. These metrics are compiled into a dashboard report highlighting patient travel time and costs, along with savings, which enables further conversations with clinical specialties regarding service provision.

RESULTS

More services have integrated telehealth as a mode of service delivery following data driven conversations. However, defining the parameters for quantitative and qualitative evaluation on a regional and national scale has been an iterative process, constrained by data collection capabilities and inconsistencies, limited previous work in this area and varying stages of telehealth programme development between Health Boards.

CONCLUSION

Frameworks considering the design, implementation and evaluation of telehealth programs offer some value. However, programme analysis must focus on developing comprehensive patient focused measures and meaningful activity assessment in the patient context.

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Telemedicine Proof of Concept Project - Eastern Health

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AIM

To determine if the use of telemedicine, in a pilot program, can improve patient experience, staff satisfaction and service sustainability, when applied in different environments across Eastern Health.

METHODS

A proof of concept approach was undertaken to trial telemedicine across the following clinical settings: First patient cohort selection: 1. Inpatients at a continuing care site requiring vascular or plastics review in specialist clinics at an acute site. 2. ED patients at the Angliss Hospital requiring mental health assessment or review by consultant psychiatrist. Second patient cohort selection: 1. All presentations to the Angliss ED between 1400-2200 hours requiring mental health assessment. 2. Specialist Liver clinic patients at Maroondah Hospital requiring Chin Hakka interpreter services. Utilising ERIC (Eastern Robotic Integrated Care) and ERICA (ERIC's Associate) patient reviews were undertaken at the site they were located, thus eliminating the need for transfer to another site.

RESULTS

Evaluation methodology included both qualitative and quantitative data. Findings: Patient experience: 87% of patients responded 'strongly agree' or 'agree' to the question 'overall, I was satisfied with having a video consultation in lieu of a face-to-face appointment'. 87% of patients responded 'strongly agree' or 'agree' to the question 'I would be happy to have another video consultation'. Feedback from Consumers: Positives :- convenient for patients and carers - seen by provider sooner- no missed rehabilitation, meals, medications, etc. Negatives:- difficulty hearing in noisy environment (ED) \$14,641 in savings (direct and indirect) was achieved through:- elimination of patient transport- elimination of staff travel- elimination of outsourcing to external language services- ED hours saved- waste reduction.

CONCLUSION

Noting a small sample size, the trial of telemedicine was able to demonstrate service sustainability through: reduced transport costs, reduced nursing time in specialist clinics, reduced interpreter costs and reduced time spent in ED. Lessons learned included:- agree on what success will look like, before starting- select the right device for the environment- where multiple programs are involved, engagement by all is needed to determine workflow processes, roles and responsibilities. Where to from here? Establishment of an eastern Health Telemedicine Unit and appointment of Manager, Telemedicine@Eastern. Review of transport bookings and cost. Consultation with clinicians. Explore device options. Expression of Interest from clinical staff and programs to implement Telemedicine@Eastern program.

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Developing a telehealth support model for women undergoing breast cancer surgery in Australia.

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AIM

For breast cancer patients, the periods prior to and following breast surgery can be characterised by feelings of fear, anxiety, isolation and uncertainty [1-3]. Provision of appropriate educational, cognitive and emotive pre-operative information has been shown to reduce post-operative anxiety, length of hospital stay and post-operative complications [4]. Additionally, reducing the need for post-operative travel to post-operative consultations may reduce healthcare burden and costs, without compromising patient safety [5]. A telehealth support model has been proposed for breast cancer patients, comprising of 1) a specialised web program with information about preparing for and recovering from breast surgery; and 2) the option of a post-operative teleconsultation using Scopia technology, instead of a face to face follow-up appointment. This study aims to examine the preliminary acceptability and feasibility of the proposed telehealth support model for women scheduled to undergo breast cancer surgery.

METHODS

Participating breast cancer surgeons from one Australian health district will inform their eligible patients (aged 18-85 years, scheduled to undergo surgery for breast cancer, with internet and webcam access) about the study. The research team will provide patients who consent to participate (intended n = 15) with personalised access to both telehealth support model components. Preliminary feasibility will be assessed in terms of: i) patient consent rates; ii) patient use of the web program (assessed by inbuilt online monitoring tools); and iii) proportion of patients who accept video consultation as their sole means of follow-up. Acceptability will be assessed using patient participant feedback via a semi-structured telephone interview and surgeon participant feedback via a brief online survey.

RESULTS

This study is ongoing, with preliminary findings to be presented at SFT-16.

CONCLUSION

Study findings will help to modify and refine the proposed telehealth support model, which will subsequently be tested using a randomised controlled trial.

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Alcohol Usage Intervention based on a Conversational Agent.

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AIM

Online health assists consumers to seek professional health services and advice. Its acceptance arises from providing the client with anonymity, security, immediate access, reliability and non-biased recommendations. This study investigated suitability of a chatbot intervention to address alcohol drinking habits in young adults 18-25 years, the highest consumers of alcohol per capita in Australia. The overall intention was to test chatbot competency in achieving acceptable levels of: i) sophistication, ii) structure and flow of conversation, iii) logic and reasoning.

METHODS

An AIML chatbot was developed to converse with users in human-like manner. Its primary task was a standard assessment of alcohol drinking habits using AUDIT-C [1] indicating the level of health risk. Additionally, the chatbot provided information and education on responsible alcohol use, giving recommendations and feedback post-assessment. Administration of a Client Satisfaction Survey [2] and structured interviews followed, exploring: a) aspects influencing satisfaction or dissatisfaction; b) overall conversational experience including reasoning/understanding; c) simplicity and ease of use including user friendliness/navigation; d) suggestions/comments on improvements.

RESULTS

Usability and user-satisfaction were determined by a cohort study of 17 volunteer participants. A mean satisfaction level of 8.5/10 was achieved across all survey questions. User dissatisfaction arose from the need to type utterances rather than speak naturally: this could be overcome by a speech recognition interface variant. The chatbot failed to recognize some keywords and gave too much information, resulting from use of the highly structured conversation maps.

CONCLUSION

Overall the trial indicated strong positive reception of the intervention by users. There was some indication from users that availability of chatbot variants with different behaviour and sophistication in their conversational ability would further enhance user satisfaction and perception of the chatbot usefulness. However, this would require more complex modelling of the conversational agent's reasoning, in contrast to the aspired simplicity of the trialled implementation.

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Telehealth for fall asleep drivers - it could mean life or death.

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Weekly at the Sleep Clinic at Waikato Hospital I see at least one if not 5 patients who have fallen asleep at the wheel. This may have happened once in the last 12 months or too many times to count in the week before their appointment. Some have had motor vehicle accidents after falling asleep driving their cars, others while driving trucks, or operating heavy machinery. Nearly all have crossed the centre line or gone off the side of the road, not always alerted by rumble strips or the loose metal. Often they are woken by their passenger screaming or shaking them but sometimes to the sound of another vehicles horn, waking up just in time to avoid a head on collision. These patients are here to tell the tale but I wonder how many of those killed or severely injured in such events could have reported the same situation if they had the chance. Some of these drivers are sleepy at the wheel because they have a sleep disorder, others because of lifestyle factors or hours of work required. Some are lucky enough to live in our immediate area, but a lot live rurally and have hours to drive to attend appointments. One patient recently failed to attend 2 first assessment appointments because each time he attempted to drive the 2.5-hour trip from his home to the clinic he had to pull over to sleep at the side of the road. I finally interviewed him at his local hospital using Telehealth. Telehealth clinics are now run from Thames, Tokoroa, Te Kuiti and Taumarunui Hospitals. The only negative is that the patient who has a history of falling asleep driving can still choose to travel to us for consultations.

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The Mobile Phone, the Telephone and Telemedicine : Historical Parallel?

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It is 140 years since the first telephone call and 43 years since the first mobile phone call. With the evolution of the mobile phone from a simple calling and receiving device to the smartphone, its ubiquity, and the burgeoning number of medical applications, use of mobile phones is growing. Its use in clinical practice for communication, data, image, audio and video transmission, and subsequent management decisions raises the standard legal, regulatory and ethical concerns of telemedicine; confidentiality, privacy, data security, data storage, consent, etc. But are these issues new? All that has happened is that the communication technology has changed from analogue to digital and from fixed line to wireless. The legal and ethical issues, while nuanced, remain the same. This paper explores problems encountered with the introduction of the telephone in clinical practice and subsequently the mobile phone, and compares them. Concerns of confidentiality and privacy have moved from shared party lines, operator assisted calls and fixed line private medical telephone networks to password protected devices, open networks, instant messaging groups and end-to-end encryption. Police intrusion during calls now relates to electronic eavesdropping, and police and security forces demanding decryption of data on phones. Telephone use for tele-ecg transmission in 1905, tele-auscultation in 1910 and a personal electrocardiogram transmitter allowed transmission of images and sounds, applications that we consider modern. The risk of cross infection from contaminated hand pieces of public telephones, remains with reports of contamination of health workers' mobile phones. Abuse of the telephone by patients for cheap consultations raised a call for remuneration and concerns about quality of care. The need for a prior doctor patient relationship before a telephonic consultation, ergonomic design and overuse injuries, and telephone addiction are not new. There is much to learn from the analogue age.

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Challenges in implementing Randomised Control Trials in Health Service Implementation Research: Protocol issues in a telehealth trial in residential aged care.

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AIM

In 2011, the Australian government introduced Medical Benefits Schedule (MBS) funding to support video-consultations. Funding is offered to residential aged care facilities (RACFs) (for hosting and equipment), GPs (to join consultations) and specialists (for consultation time and equipment). Randomised Control Trials (RCT) are often regarded as the preferred method for testing whether an intervention changes outcomes. There are considerable challenges in designing an RCT for health service research. There is a risk that the research project may have little relevance to the 'real' world. The study will examine the effectiveness of telehealth to reduce utilisation of external health services by residents in long term care. The aim of this paper is to consider the challenges of implementing RCTs in health service research from the perspective of this RCT study.

METHODS

This pragmatic RCT is currently recruiting 880 cases (440 new residents, and 440 existing) from 10 facilities (five of which will be intervention sites). The primary hypothesis relates to the 440 new residents, but an existing cohort is also being recruited for comparison purposes. The inclusion criteria is long term permanent residents of RACFs of all care classifications (high, low, aging in place), but not respite care. The primary endpoint is the number of external health care visits during the trial period (including transfer out of the facility, hospital admission, ED episode, death, external specialist consultation).

RESULTS

Modifications to the protocol were required to meet challenges related to implementing within a complex health service including: randomization process; inclusion and exclusion criteria; GP referral guidelines; and clinical protocols for geriatricians. Ongoing negotiations with RACF stakeholders to accommodate research goals with health service delivery is required. Maintaining data and protocol integrity at all times is crucial.

CONCLUSION

The number of stakeholders involved in health service research requires collaboration and negotiation for successful quality research studies.

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REthinking MOfel of Diabetes care utilising E-heaLth (REMODEL).

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AIM

Conventional outpatient services are unlikely to meet burgeoning demand for diabetes services given increasing prevalence and costs, coupled with workforce shortages. New technologies (such as smartphone and wireless sensors) create an opportunity to redesign outpatient services. Department of Diabetes and Endocrinology at Princess Alexandra Hospital (PAH), the UQ Centre for Online Health and the CSIRO collaborated to develop a mobile-based remote monitoring system (MRMS) to support the management of complex outpatient diabetes patients. The MRMS is based on a validated mobile health platform for home-based delivery of cardiac rehabilitation and comprises a mobile app, web-based database, and clinician dashboard. Blood glucose levels (BGL) data are automatically transferred by a Bluetooth-enabled glucose-meter to a clinician dashboard via the mobile app. Aim: To examine if a new model of care employing MRMS in complex type 2 diabetes (T2DM) patients attending a tertiary service (PAH) is clinically effective (improved glycaemic control) at reduced cost of service delivery compared to routine care.

METHODS

Following proof of concept and feasibility studies, a pilot pragmatic RCT will recruit 40 T2DM PAH patients. After developing a diabetes management plan with the endocrinologist, they will be randomised to the intervention or control group for 12 months. The control group will receive routine care. The intervention group will be supported by the MRMS enabling the endocrinologist to remotely monitor BGL and text message patients. Participants will be encouraged to complete a survey before each appointment - details regarding current diabetes management and issues to address. Using this information, the endocrinologist may choose to substitute in-person follow-up consultations with telephone or video-consultation.

CONCLUSION

This study's outcomes will provide evidence on the capacity for a new model of care using MRMS to improve glycaemic control; improve patient experience; reduce reliance on physical clinics, preventable hospitalisations and readmissions; and decrease service delivery cost.

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Benefits and Dis-benefits of voluntary service engagement: Lessons learned from developing Telehealth Outpatient Services in Waikato DHB

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BACKGROUND AND AIMS

The Waikato District Health Board is the 6th largest DHB in New Zealand, however it serves the largest rural population and provides tertiary healthcare services across the Midland region, with a combined population of over 850,000.

Delivering healthcare services 'closer to home' using technologies such as Telehealth is a key DHB strategy in helping improve access to quality healthcare for patients, particularly in the rural setting.

The Telehealth project started with an ambitious scope - delivering improved patient care while reducing travel by using Telehealth technology across the Waikato DHB. Due to infrastructure limitations, the initial project focus was limited to Waikato hospital and the four rural hospitals.

METHODS

The Telehealth rollout project began in mid-2014 with a group of early adopter services identified. Site surveys of each hospital were conducted in conjunction with interested staff, in order to determine optimal equipment solutions for clinical & non-clinical needs. Service engagement began slowly, with the first service going 'live' immediately following the equipment rollout in June 2015.

Service engagement has been consultative, following a model of 'voluntary service adoption', looking at how each service and facility might benefit from the use of Telehealth. Usage scenarios and patient suitability criteria were identified, and standard models for outpatient delivery developed.

RESULTS

Of the 50 services & sub-specialties approached, 10 are actively using Telehealth for outpatient appointments. These services represent a cross-section of centralised, rural outreach and regional outreach specialities, providing a comprehensive view of the challenges and opportunities for adopting Telehealth as a tool for enabling transformational change across the DHB and the Midland region.

CONCLUSION

While patient and clinician responses to Telehealth clinics have been predominantly very positive, the pace of adoption and patient volumes have been lower than planned. The specific benefits and dis-benefits of this slow-growth voluntary service adoption will be reviewed in this study.

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Achieving Real Scale in Telehealth - the Invisible Barriers

Ernie NEWMAN ¹

1. Ernie Newman Consulting Ltd., New Zealand

Since 2012 Ernie Newman has undertaken telehealth projects commissioned by 3 different District Health Boards in New Zealand. His first involvement was in leading the Telehealth Demonstration Project - a combined initiative of central government with the Bay of Plenty District Health Board. This initiative installed video capability in 50 health premises in the Bay of Plenty including primary practices, hospitals, aged care facilities, palliative care, allied services and mental health. Its aim was to learn what worked and what didn't. The second extended the concept and the Project to the Tairāwhiti District Health Board. This involved video-equipping 9 health facilities around East Cape, one of the more remote and deprived communities in New Zealand and a beneficiary of the government's Rural Broadband Initiative. It enabled health clinics that often are staffed only by nurses to get support by video from general practitioners, specialists and hospital-based clinics. His most recent contract involved establishing video health services among 5 hospitals in Samoa including some very isolated hospitals, and between Samoa and Auckland's Middlemore Hospital, on behalf of the Counties Manukau District health Board. A key learning was the enormous range of obstacles that the health system puts before those seeking to embed positive changes on a large scale. Pilots are easy, but embedding these into business as Usual is a Herculean task. The technology is leaping ahead, but the health system remains imbued in cultures, attitudes and practices that date back to the 20th century and earlier. This presentation will discuss the successes and failures. Most importantly it will focus on why despite the high quality and affordable technologies available, the big constraint on telehealth growth is people. The structures we have established, financial models, and ingrained habits have resulted in the adoption of digital-era services in health being a decade behind other sectors. Ever an optimist, he will present some challenging ideas how these blockages might be overcome.

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Waikato Teledermatology in 2016.

Amanda OAKLEY ¹

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Dermatologists in Hamilton, New Zealand, offer a comprehensive telehealth service. We have 20 years' experience of interactive and store-and-forward systems. Around 1,000 interactive consultations using video conferencing equipment over ADSL to patients at 4 remote healthcare facilities taught us that video was useful for monitoring inflammatory dermatoses, e.g. a patient with psoriasis on methotrexate. Now, the Virtual District Health Board by HealthTap® offers a more convenient and secure service to patients in their own homes, via desktop, tablet or mobile. Waikato DHB has partnered with MoleMap New Zealand, a private skin lesion diagnostic and archiving service, to provide Virtual Lesion Clinic store-and-forward diagnoses for 5,000 patients since 2010. Only 25% of lesions require specialist management, and many of these can be directly triaged to surgery, bypassing lengthy outpatient clinic waitlists. New Zealand Teledermatology has used the Collegium Telemedicus platform to provide advice to local GPs for > 1,300 cases over the last 3 years. They complete a referral template and upload images, to get a response within a median of 2 hours; this timeframe saves on unnecessary consultations, pharmaceuticals and biopsies, and is highly educational for the GPs. Waikato DHB's eTriage system makes it easier to "decline" referrals "with advice". We are adapting the generic referral to ensure referrers expecting advice will include the information we need to be effective. Insecure e-mail consultations are increasing, especially as an alternative to in-patient consultations. An audit has confirmed that these are often characterised by limited history, poor-quality images and lack of patient informed consent.

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A Systematic Review of mHealth Interventions in Two African Countries.

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AIM

The African health system is laden with a barrage of challenges. Such challenges range from inequality in access to health care, increasing cost of health services, to inadequate health facilities and shortage of personnel. Particularly, the continent is burdened by such diseases as HIV/AIDS, tuberculosis, high maternal and child mortality rates among others. Mobile health (mHealth) is the application of mobile technologies in providing health services and information. Studies have shown the feasibility of mHealth in improving health outcomes in many African countries, especially in the light of the pervasive nature of mobile technologies in the region. However, effectiveness studies seem elusive. Hence, this paper systematically reviewed literature evaluating the effectiveness of mobile health interventions in two of sub-Saharan Africa's largest economy - Nigeria and South Africa.

METHODS

A literature search of academic databases such as PubMed, ScienceDirect and EbscoHost was conducted. The search focused on empirical studies on mobile technologies and healthcare carried out in Nigeria and South Africa between 2011 and March 2016. The search and initial pruning yielded 39 papers, but ten papers adopting randomised controlled trials were eligible for review.

RESULTS

It was revealed that text messages (SMS) is the primary mobile technology adopted for causing an improvement in health actions or triggering behavioural changes. mHealth interventions can cause an improvement in health outcomes and possibly transform health systems. However, there is no sufficient evidence to conclude that the use of mobile phones caused significant improvement in health outcomes.

CONCLUSION

For mobile health (mHealth) projects to scale and be sustainable in Nigeria and South Africa, there is a need for more randomised controlled trials to provide clear evidence on the effect of such mHealth interventions on health outcomes.

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NZ Telehealth Resource Centre - Supporting people to implement telehealth. Making something from nothing.

Andrew PANCKHURST¹

1. NZ Telehealth Resource Centre, New Zealand

AIM

The NZ Telehealth Resource Centre (NZTRC) was formed in 2014 through a partnership with Mobile Health and The NZ Telehealth Forum (NZTF). The NZTF promotes the use of telehealth in the provision of health care. In practical terms its focus is providing leadership, strategy and direction for telehealth in NZ. The goal of the NZTRC is more grass roots, providing support, guidance and resources for people who want to set up or improve a telehealth service in NZ. Started from nothing in 2014 the resource centre has become a valuable hub of information. We will honestly speak about what we have and have not achieved, and the reasons behind these successes and 'failures'.

METHODS

The TRC website (www.telehealth.co.nz) provides a hub for a wide range of telehealth information reflecting the varied audience which includes clinicians, administrators, technical staff and patients. Where possible this information has been localised to the NZ context. Support is also provided by phone, email and in person visits where possible. Mobile Health has contracts with the Ministry of Health for services including surgery, education and collaboration, however receives no specific funding for the NZTRC. The service is provided on a 'best efforts' basis.

RESULTS

The NZTRC has been extremely well received, with regular inquiries and excellent feedback. The ability for the NZTRC to increase the support and promotion of telehealth and to expand the website has been constrained due to limited resources. In many ways we are just scratching the surface of what could be achieved and we have a long list of projects to implement!

CONCLUSION

The last 24 months has been an excellent start, but the next phase could benefit from an increasingly pro-active approach especially through enhancements such as the web discussion forum, social media, newsletters and many other initiatives. The NZTF also have a web presence through the Health IT Board website so we are currently consolidating the two sites to create a single web presence for telehealth in NZ. This will create a sound platform to further promote telehealth in New Zealand. We would like the opportunity to articulate the things that have gone well, the areas where we have struggled, and our vision for the future.

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www.telehealth.co.nz or www.nztrc.org.nz
<http://healthitboard.health.govt.nz/who-we-work/new-zealand-telehealth-forum>

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Data Mining Techniques for Patient-Centered Mobile-Based Information Systems: Applications toward Personalized Care.

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AIM

Smart phones have been representing a promising technology for patient-centered health care. Out of around 40,000 available mobile health apps, more than 16,000 were deemed consumer oriented through various functions. It is claimed that data mining techniques have improved mobile apps to address patients' needs at sub-group and individual levels. This study has reviewed the current literature regarding data mining applications for patient-centered mobile based information systems.

METHODS

We searched PubMed, Scopus and Web of Science for original studies reporting from 2014-2016. After screening 226 records at title/abstract level, the full text of 92 relevant papers were retrieved and checked against inclusion criteria. Finally, 32 papers were included in this study and reviewed.

RESULTS

Data mining techniques have been reported in the development of mobile health apps for three main purposes: 1) Data analysis for: a) follow up and monitoring, b) early diagnosis and detection for screening purpose, c) classification/prediction an outcome, and d) risk calculation (n=27), 2) data collection (N=3), and 3) provision of recommendation (N=2).

CONCLUSION

Embedded features in mobile apps to collect patients' data during their self-management save data after being used by patients gradually; by using data mining techniques specificity and capability, collected data are analysed for various purposes such as prediction, risk estimation or detection. More intelligent methods such as artificial neural networks, fuzzy logic and genetic algorithms and even the hybrid of them may results in more patients-centered recommendation and provide education, guidance and even alert and awareness in personalized oriented output.

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Virtual Reality Applications for Chronic Diseases Care: A Review Study

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AIM

Virtual Reality (VR) is a computer technology that simulates real environments and situations in which the user can interact with the environment as if he was in the real world. VR has been used in numerous medical disciplines and health care services. The aim of this study was to summarize the published literature on VR for chronic disease management and rehabilitation.

METHODS

We searched PubMed in April 2016 and after screening 117 records at title/abstract level, full text of 52 full papers which met the inclusion criteria were retrieved and reviewed.

RESULTS

Based on reviewed papers, application of VR for chronic diseases care can be categorized into two main groups: 1) Treatment applications and 2) Rehabilitation applications. For treatment intention, several studies have been conducted on psychological disorders care and support including different types of phobia disorders (N=20), eating disorders, schizophrenia, and post-traumatic stress disorders. Other therapeutic applications of VR concerned periodontics, alcoholism, smoking, pruritus, neck pain, obesity, diabetes, fibromyalgia, and cervical kinematics (N=18). For rehabilitation purposes, 13 studies have reported on stroke and one study on multiple sclerosis. Out of 52 papers under review, 40 reported successful outcomes and two studies reported failure in achieving intended therapeutic effects. The results of the remaining ten papers were not conclusive.

CONCLUSION

Virtual Reality has been successfully used for rehabilitation of people with chronic diseases, but there is no conclusive evidence on its success for treatment purposes. During the years of 2001 and 2005, the main focus of VR application has shifted from treatment to rehabilitation. Only simple video or games application for patient advocacy are not well defined applications of VR.

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Internet of Things (IoT) applied to COPD disease

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1. University Military Nueva Granada - ISfTeH member, Colombia
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AIM

The Chronic Obstructive Pulmonary Disease COPD [1] is a respiratory problem with the greatest prevalence and socioeconomic impact in the world, due to its high frequency, its progressive clinical course and its assistance requirements, it establishes a medical problem [2], being the seventh mortality cause in Colombia and affecting more than 1.033.394 people.

METHODS

The methodology is based on the measurement and tracking of the oxygen saturation [4] and the body temperature [5] in patients with COPD. The registration, storage and the signal processing is made by means of a Hub-IoT designed to access information about health to Cloud Computing.

RESULTS

The results showed the advantages of using IoT in health, where each installed remote sensor sends independent information with the possibility of adapting the programming of the amplitude, sampling and sending time of data to storage and update the already stated registers. The use of Cloud Computing allows the processing of big data and it applies techniques of artificial intelligence to characterize and create patterns of each patient and by alarming the prediction of the gravity of the COPD it is possible to achieve the infection detection to support COPD control. The remote accessibility to the information of each patient, allows the doctor have a complete tracking in time intervals, apart from having real time values, averages, critical and historical values.

CONCLUSION

In conclusion of the set out solution is to allow the assessment and tracking of patients with COPD in free environment and it demonstrates that IoT health applications give new connection possibilities between sensors with complementary systems to the health system like ambulances and pharmacies.

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NZ Telestroke Pilot: Challenges and Solutions

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AIM

Stroke is the third most common cause of death worldwide. Rapid (<4.5 hours) administration of stroke thrombolysis can help to improve outcomes, but relies on expert supervision. This project focuses on using video/tele-imaging equipment to enable after-hours access to stroke experts to supervise the emergency treatment of patients suffering an acute stroke in smaller centres where 24/7 expert cover is not consistently available.

METHODS

This is a Ministry of Health funded pilot project (1 June through 30 November) operating via a 'hub-and-spoke-model': Wellington Regional Hospital ('hub hospital') provides after-hours neurology assessment using Vivid video/tele-imaging equipment for four spoke hospitals (Wairau, Nelson, Palmerston North, and Hawke's Bay). The on-call Wellington neurologist links into the patient-end Polycom videoconferencing units using 3G iPads, assesses the patient and views radiological images to make a treatment decision. Clinical and technical data is recorded in MS Access database. Patient and staff feedback is obtained via feedback forms.

RESULTS

To date 61 patients have been treated using telestroke; 34 of these regional hospitals. Technical issues precluded video assessment in four cases (6.6%) with a mix of issues reported. User feedback has been positive. Clinical governance issues, funding model, and IT set-up took several months to fine tune.

CONCLUSION

Initial findings indicate that this type of service is used effectively to provide expert support to regional hospitals. However, several expected, and some unexpected challenges arose throughout the project. This presentation will show case specific challenges and implemented solutions.

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The Success of the UnPlanned.

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A Case Study. Thames Hospital is a small rural hospital with an active Telehealth service linked to Waikato Hospital, which is just over an hour's drive away. There has been a growth of planned Telehealth clinics at Thames Hospital Outpatient Department. The Oncology Department has weekly planned clinics and as a result has been able to take advantage of the equipment for unplanned activity, this case report centers on one such patient experience. Julie, a patient of the Thames Oncology Unit, who has breast cancer and metastatic disease, had an unexpected turn of events. One that led Julie to a trip to the Emergency Department, with elevated bilirubin and deranged LFT's, and then ended up in a Telehealth clinic formulating a plan of care with her Oncologist. The use of Telehealth in this situation for Julie, and her husband, was a positive experience, even though she received devastating news that her cancer had now progressed and was in the end stages and that, apart from comfort cares and symptom management, there were no interventions to be done. Julie was able to receive her updated diagnosis from her Oncologist, who could also answer the many questions that she and her husband had in a more specific way than that of an ED doctor. A plan of care was also developed and the necessary referrals completed. The success of this Telehealth clinic enabled technology to enhance Julie's experience and improve her patient focused outcome. This experience demonstrates the success of this technology.

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How Do You 'Scale' Telehealth?

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AIM

e-Health (the use of Information and Communication Technologies for health) is an opportunity cost, potentially redirecting already scarce resources away from traditional care. Wise investment is needed. Despite having a disappointing cost-benefit evidence-base, e-health is being implemented globally in developed, developing, and even least developed countries! In the last decade publications have increasingly made reference to the 'scaling' or 'scale-up' of e-health applications. But what exactly is meant by these terms, and how can it be achieved? If successful scaling means integration, then teleradiology is scaled, but few other examples of scaled telehealth services exist. Worse, little insight and guidance is available. The study aim is to review literature and provide insight regarding scaling and scale-up of e-health, specifically telehealth, initiatives.

METHODS

The literature was searched for publications related to scaling of telehealth initiatives, using PubMed and Google Scholar (first 100 hits reviewed), and ((Telemedicine OR telehealth) AND (scale-up OR scaling)). Inclusion criteria were: Concepts directly linked, English language, no date restriction. Sixteen unique resources were selected and reviewed, supplemented by handsearching, and summarised to develop insight and understanding.

RESULTS

Many resources referenced 'large-scale' projects, but offered no value in understanding scaling. Others referenced only marginal scaling (e.g., from one to four facilities). The literature emphasises only proven, successful initiatives should be considered for scaling, highlighting the need for sound evaluation. A spectrum of technical, social, sustainability, leadership, and partnership challenges must be resolved prior to attempts at scaling. A thorough understanding of local context and need are required.

CONCLUSION

Scale-up is about expanding impact and not merely about becoming large, and is not synonymous with sustainability or success. Awareness of these differentiations and published guidance for scaling of telehealth initiatives is poor. Insight is available from the 'health' literature, but specific guidelines and principles for telehealth are needed.

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A small-scale randomised controlled trial of home telemonitoring in patients with severe chronic obstructive pulmonary disease.

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AIM

This was a pilot study to examine the effects of home telemonitoring (TM) of patients with severe chronic obstructive pulmonary disease (COPD).

METHODS

A randomised controlled 12-month trial of 42 patients with severe COPD was conducted. Home TM using oximetry, temperature, pulse, electrocardiogram, blood pressure, spirometry and weight with telephone support and home visits was tested against a control group receiving only identical telephone support and home visits care.

RESULTS

The results suggest that telemonitoring had a reduction in COPD-related admissions, emergency department presentations and hospital bed days. Telemonitoring seemed to increase the interval between COPD-related exacerbations requiring a hospital visit and prolonged the time to the first admission. The interval between hospital visits was significantly different between the study arms while the other findings did not reach significance and only suggest a trend. There was a reduction in hospital admission costs. TM was adopted well by most patients and eventually also by the nursing staff though it did not seem to change patients' psychological wellbeing.

CONCLUSION

Ability to draw firm conclusions is limited due to the small sample size. However, the trend of reducing hospital visits warrants a larger study of a similar design. When designing such a trial, one should consider the potential impact of the high quality of care already made available to this patient cohort.

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Te Hono - The Bridge

Kirk SMITH ¹, Roy DAVIDSON ², Walea SAWEIRS ², Maureen ALLAN ³

1. Main Te Hiku Hauora, New Zealand
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3. Whakawhiti Ora Pai, New Zealand

The Far North District of New Zealand comprises an area of 7400km² with a population of 54,000. Te Hiku Hauora and Whakawhiti Ora Pai are primary care, Maori health NGO's which provide medical coverage for 19,000 people within the district, in an area 130 km long and 74 km wide. Over half the patients registered with these providers are Maori, and the average income for the area is one of the lowest in New Zealand. Travel times between the 6 clinics involved can be up to 2 hours, with travel times between the clinics and the regional hospital in Whangarei being up to 5 hours. The patients that live in the area and the 13 GPs that provide care for them are separated from specialist care by both geography and lack of access to transport. In an effort to extend specialist care over this remote area the Te Hono (Telehealth Enabled Health Outcomes Northland. The Maori translation meaning to 'bond' or 'link') project was developed based on video conferencing technology. Te Hono provides GPs, Practice Nurses and Chronic Care Mobile Nurses regular scheduled times to review specific patient cases, and just as importantly, use these as springboards for wider clinical discussions with specialists in Whangarei and each other. This enables collegial support within the district and the wider region. Development of this has taken several years and involved a number of hurdles including poor quality ADSL internet, old equipment, a culture of isolation, and a feeling of being already overwhelmed by the ongoing workload. This is a story of moving toward improved regional health care through partnership and the utilisation of technology to break down barriers. Much progress has been made with more potential on the horizon.

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Teledermoscopy for skin cancer in Australia: Is it cost-effective?

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AIM

To determine the cost-effectiveness of teledermoscopy for clinical consultation of suspected skin cancer using decision analysis modelling.

METHODS

A decision analytic model was constructed to compare conventional care with teledermoscopy in the Australian context. Pathways of care were modelled based on clinical guidelines from when a patient had suspected skin cancer through to treatment for melanoma, keratinocyte skin cancer, and benign neoplasms. Cost information was sourced from the Medical Benefits Schedule and included consultation, pathology, and excisions costs. Probability data was systematically sourced from peer-reviewed literature and published government reports. Incremental cost-effectiveness ratios (ICER) were calculated and one-way sensitivity analyses were performed. Effectiveness endpoints included time in days to clinical resolution (diagnosis or excision), and avoided benign neoplasm excisions.

RESULTS

The mean costs of conventional care were AU\$334.25 compared with AU\$336.31 for teledermoscopy. Teledermoscopy resulted in an estimated 91 fewer excisions of benign lesions (per 1000 patients) compared to conventional care. The time in days to clinical resolution (diagnosis or excision) was shown to reduce from an average of 35 days for conventional care to 11 for teledermoscopy. The incremental cost-effectiveness ratio was AU\$0.09 per day to clinical resolution. Sensitivity analyses showed that the general practitioner teledermoscopy referral rate was the most influential probability affecting the results, changing the ICER 55-165%.

CONCLUSION

The incorporation of teledermoscopy into the pathway for suspected skin cancer in Australia has the potential to benefit patients and optimally allocate resources. Involving a dermatologist in the diagnosis process via teledermoscopy has the potential to reduce the number of excisions performed on benign neoplasms, reduce face-to-face consultation burden for dermatologist services, and reduce the time to clinical resolution for suspected skin cancer in Australia.

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Barwon Health's Personalised Health Care: An RCT Pilot for the delivery of Chronic Disease care with patients using a home monitoring tele-health solution.

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1. Barwon Health, Australia
2. Deakin University, Australia

AIM

In December 2013 Barwon Health commenced the delivery of a home tele-monitoring program. Project Aim: The primary aim of this pilot study is to decrease the emergency presentation rate and hospitalisation of clients that have been identified as being at risk of presenting to the acute service within the next 12 months.

METHODS

Method A randomised controlled methodology was used in this pilot study. Two diagnostic groups of COPD and diabetes were established. An economic evaluation was also undertaken.

RESULTS

There is evidence to suggest that those in the intervention group had fewer emergency presentations and admissions than those in the control group. There was a statistically significant difference in the mean hospital length of stay over the 12 months of the pilot. Table Mean Total Cost and Cost Difference of Personalised Health Care PHCP Intervention n=86 Usual care n=85. A means Total cost of the intervention including hospital costing data was \$12,796 and for usual care the total mean cost was \$12,081. The total mean difference was \$714 in favour of the intervention. A demonstrated difference of 0.08 in quality adjusted life years saved is likely to be clinically significant. The overall outcomes for the heiQ showed improvement in outcomes domains that were similar to the Australian Benchmark.

CONCLUSION

The savings in hospitalisation costs in the intervention group did not offset the higher PHCP intervention costs. Positive quality of life and health literacy outcomes support the intervention as effective and user friendly. Opportunities for the future present themselves in regards lower cost of service delivery.

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The role of the Virtual Medical Conference.

Eddie TAN ¹

1. Waikato Hospital, New Zealand

AIM

To explore the role of the Virtual Medical Conference (VMC).

METHODS

Telehealth is a vast subject and covers not only patient care, but also health education. Clinicians often undertake lengthy travel attending conferences for ongoing professional education. This is time-consuming, tiring, expensive and associated with jet-lag. One solution is the VMC. The VMC can exist either as a stand-alone or in parallel with a main conference. Essential elements for success are: good internet connection, electronic media (computers, tablets and mobile phones), computing support and good central organisation. Participants (presenters, audience and sponsors) log on/off when necessary and interact via the virtual platform. Posters (with moderated sessions) are displayed in a virtual hall. Virtual booths (with tiered levels) allow for industry presence and sponsorship. Time-zone differences can be resolved with recorded sessions for subsequent viewing.

RESULTS

Advantages of VMC: cost-effective, limitless audience size (no restrictions to space and local facilities: hotels, restaurants and transportation), easy organisation (no facilities booking required), flexibility (can be incorporated to work and personal schedule; even allowing retrospective attendance), seamless attendance/movement between any parallel sessions/lectures, provides valuable analytics (delegate participation, movement and feedback accurately collated digitally), facilitates digital networking (accelerating pipeline deals), environmentally friendly (no travel or printouts of brochures/data-sheets), safe (no travel risks), wide catchment worldwide. Disadvantages of VMC: inappropriate for certain conferences (especially ones requiring 'hands-on' participation), lack of physical contact potentially off-putting, potentially less revenue, perceived as 'inferior', cyber-security and copyright-protection issues.

CONCLUSION

VMCs have many potential advantages. However, compared to mainstream industry, they have not taken off yet. This entire telehealth conference (for example) could be made virtual or at least have a virtual stream, in line with its philosophy. More work is required to make this concept more appealing and acceptable as a viable alternative to attending a physical medical conference.

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Lessons Learned Through 20 Years of TeleHealth Experience.

John TARRANT¹

1. MedTech Global, New Zealand

AIM

Where we have been, Where we are now, Where we are going

METHODS

The presenter will outline what has been learned through the formation of a Government funded telehealth system 16 years ago. The impact of technology, and the evolution of Telemedicine to Telehealth. We are at the point of one of the most significant times in healthcare delivery as our model changes from reactive to proactive. Telehealth will be the instrument facilitating this change. However, changes do not occur without obstacles and the presenter will describe what has been done in the USA to resolve: Funding, Public Acceptance, and Provider Acceptance. The expansion of TeleHealth services will provide significant advantages to many different areas. A few of which include: Education, Prisons, Public Health, Industry, and Elder Care. In conclusion, the Presenter will theorize where telehealth is going in the future, and how it will impact healthcare delivery, and our daily lives.

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Substitution rates of video consultations for traditional consultations at a tertiary public hospital.

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AIM

To find the rate of substitution of telehealth for traditional outpatient consultations in a tertiary public hospital and to identify opportunities for increasing telehealth activity.

METHODS

Retrospective outpatient activity data for both telehealth and traditional consultations were obtained for a 12-month period (April 2015 to March 2016) for the Princess Alexandra Hospital (PAH), Brisbane. Data were stratified by specialty clinic. We calculated the telehealth eligible substitution rate and the overall telehealth substitution rate for certain specialities that run both telehealth and traditional outpatient clinics. To calculate the telehealth eligible substitution rate the numerator was the number of video consultations and the denominator was total number of consultations (telehealth plus traditional consultations) for telehealth eligible patients i.e. patients residing outside of the metropolitan Brisbane catchment area for PAH. To calculate the overall telehealth substitution rate the numerator was the same as above, however, the denominator included all consultations regardless of the patient's place of residence.

RESULTS

Our dataset included video consultations (N=1088) and traditional consultations (N=41 951). Overall telehealth substitution rate was 2.5% and telehealth eligible was 17.5%. When stratified by specialty, the telehealth eligible and overall telehealth substitution rates were, respectively: rheumatology 42.0%, 5.4%; Gamma Knife[®] radiosurgery 37.0%, 16.5%; haematology 14.7%, 2.4%; nephrology 15.4%, 0.2%; cardiology 3.6%, 0.6%; spinal injuries 8.1%, 2.1%; dermatology 6.9%, 1.1%; endocrinology 49.0%, 11.5%; and neurology 5.0%, 1.0%.

CONCLUSION

The overall telehealth substitution rate is substantially lower than the telehealth eligible substitution rate. This is due to the majority of patients being from local catchment areas which are currently ineligible for video consultations with the PAH. A reportable key performance indicator from inception for telehealth may have contributed to the Gamma Knife[®] radiosurgery having the highest observed overall telehealth substitution rate (16.5%). In-home video consultations with patients who reside in metropolitan areas may increase the overall telehealth substitution rate.

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Innovation to Implementation For Telehealth (i2i4Telehealth). A Practical Guide for Knowledge Translation in Telehealth.

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“Knowledge translation (KT) describes any activity or process that facilitates the transfer of high-quality evidence from research into effective changes in health policy, clinical practice, or products” (p.355). 1 This paper will report on the development of a practical guide for knowledge translation in telehealth. The guide was adapted from a similar version produced for dementia and aged care in Australia 2, and the original guide developed by the Mental Health Commission of Canada 3. The guide focuses on the knowledge translation activities required for effective telehealth implementation. It sets the foundation for change by guiding the user to specify the innovation to be implemented, identify the key stakeholders, and set out a plan for communicating and engaging with these stakeholders. The i2i4Telehealth involves a 7-step approach: (1) State purpose of KT plan, (2) Select innovation around which KT plan will be built, (3) Specify people and actions (4) Identify best agents of change, (5) Design KT plan, (6) Implement KT plan, (7) Evaluate success of KT plan. The guide includes an additional checkpoint after the telehealth innovation has been selected (Step 2) to evaluate the readiness for telehealth within the organisation with respect to the business model and technology infrastructure available. This presentation will present an overview of the i2i4Telehealth and give practical examples of how it can be utilised in the implementation of a telehealth service.

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Optometry-facilitated videoconference uptake in Western Australia following introduction of new MBS item numbers.

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AIM

In September 2015, a new series of MBS item numbers were introduced for rural optometry- facilitated video consultations with ophthalmologists. Lions Outback Vision conducted a prospective audit of optometry telehealth activity in Western Australia.

METHODS

All telehealth bookings were made on an electronic referral booking system. Video consultations were monitored by region, demographics, use of imaging and diagnostic technology, diagnosis and management for the period from September 2015 to June 2016.

RESULTS

A total of 544 video consultations was performed between 41 referring optometrists and 4 ophthalmologists. Regional distribution includes Goldfields (13%), Great Southern (61%,) and North-West (26%). Indigenous patients comprised 9.5% of the cohort. Imaging included OCT (32%), retinal photograph (15%), visual fields (9.5%), anterior photographs (5.1%). Diagnoses included cataract (44%), glaucoma (12%), pterygium (3.7%), AMD (3.3%), diabetic retinopathy (3%), other (34%). The non-attendance rate was 5.3%. Further face-to-face clinic review was required for 7.5%. Surgery was directly booked for 44%, treatment (including laser/injections and therapeutic prescriptions) initiated for 30%. No further follow up required for 10.5%.

CONCLUSION

Telehealth has demonstrated successful integration into optometry referral pathways in rural Western Australia. The management has augmented outreach specialist visits by improving referral triage and providing continuity of care.

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The Emergency Telehealth Service (ETS) - An innovative model of emergency care for rural WA

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AIM

Geographically, the Western Australia Country Health Service (WACHS) is the largest area health service in Australia, covering 2.55 million square kilometres. Dispersed populations and regional isolation challenge access to specialist medical care and in particular specialist emergency medicine (EM). The ETS aims to deliver accessible, quality EM to country WA Emergency Departments (EDs) using the telehealth modality and Consultant Emergency Physicians (FACEMs).

METHODS

High definition video conferencing equipment, installed in participating EDs enables ETS to deliver accountable, timely EM – supporting patient management in 75 rural EDs seven days a week. ETS doctors activate and control the equipment in response to a call for assistance ensuring local clinicians are hands-free to care for their patients.

RESULTS

An innovative model of care places specialist Emergency Physicians ‘in the room’ with rural clinicians and patients, where normally only a nurse or a GP would be available. Improved transfer co-ordination with efficient appropriate referral. ETS has demonstrated the capacity to deliver improved access and outcomes for rural emergency patients. Enhances local clinician capacity, enabling better management of high acuity patients, supporting professional development and reducing professional isolation. Enhanced community confidence, reinforced by positive patient feedback. ETS has delivered over 34,000 consults with 76% of patients treated and discharged home, demonstrating the ability to manage a variety of clinical cases. There are 74 country sites accessing this service including nursing posts, small and medium hospitals and staff are fully engaged and very positive about a service that meets the patient’s and their needs.

CONCLUSION

Effectively pioneering a new service delivery model for emergency medicine, ETS has raised the clinical standard of patient care in rural hospitals and contributed to country GP workforce sustainability. ETS has introduced improved EM clinical governance, best practice and clinical leadership that is generally only available in metropolitan EDs. ETS is repeatedly and positively referenced by local communities, clinicians, and health consumers as a valuable addition to the delivery of emergency care during times of fiscal restraint, increased consumer expectation and higher levels of governance.

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The case for end user involvement in design of health technologies.

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AIM

To explore the views, expectations, practice and attitudes of registered nurses and nurse leaders working in community/primary health care settings concerning the use of mobile devices and data storage platforms.

METHOD

A mixed methods approach including an environmental scan and individual, paired and focus group interviews with 36 nurses working in community settings and nurse leaders/managers. Data were analysed using a general inductive approach (Thomas, 2006). Ethics approval was gained from the Victoria University of Wellington Human Ethics Committee.

RESULTS

Nurses have excellent understanding of issues associated with privacy, consent and the use of telehealth. With targeted, individualised education, nurses use telehealth effectively. Significant barriers to/concerns associated with the use of telehealth include: having to concurrently complete paper and electronic patient notes; multiple logins for multiple systems resulting in forgotten passwords, sharing of passwords and/or inadequate use of essential systems; lack of infrastructure in some settings - particularly those that are privately owned; inadequate systems for the use of digital cameras (e.g. for tracking wound healing); and the inability to access patient notes across systems to ensure integrated care. Ways in which barriers can be addressed include designing systems from the ground up in collaboration with nurses who will use the system, providing individualised education and ongoing support, single swipe card log on systems, increased funding for private sector providers, and improved interface for mobile technology such as digital cameras and clinical applications for smart phones.

CONCLUSION

Nurses are the largest group of health practitioners in New Zealand and are at the front line of patient care. Nurses need a good understanding of telehealth in order to be able to use it effectively and facilitate patient use and understanding. Further work is required to ensure nurses are fully engaged with the potential of telehealth and its use.

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Evolving Use of Technology for Tuberculosis TeleDOT.

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Auckland Regional Public Health Service (ARPHS) is responsible for tuberculosis (TB) treatment supervision, including directly observed therapy (DOT), in the Auckland region. Daily DOT for people with TB is the optimal recommendation of the World Health Organization. Some people can self-administer their drugs with education, regular review and nursing supervision. However the increasing evidence for, and recommendations to use daily dosing, is resulting in more people requiring daily DOT. The aim of the TeleDOT programme is to increase the number of ARPHS' TB clients able to receive DOT, within current nursing staff levels, by taking a client-centred approach to using new technology. The TeleDOT programme has embraced evolving technologies to deliver TeleDOT on a secure videoconferencing (VC) platform. Initial implementation of video-telephones was rapidly replaced by a videoconference software application on the client's personal computer with individual accounts. As advances in technology evolved, particularly improvements in video and audio definition, this software application was deployed on mobile devices; initially tablets and later smartphones. Clients use their own devices or are loaned an iPad with 3G data connection for the duration of TeleDOT. More cost effective TeleDOTs have been achieved with a move to web browser access to a secure virtual meeting room (VMR). Recently, the use of the VMR and auto-record functionality has allowed clients the convenience of conducting TeleDOT on their own schedule. The nurse reviews the recording at his/her convenience. TeleDOT is well accepted by staff and clients and is now an integral part of ARPHS' TB medicine delivery mechanisms. The technology has quickly progressed from video telephones, through the use of software applications, to web browser access from a range of mobile devices. The TeleDOT programme has achieved an increase in the number of clients receiving DOT within existing nursing staff resources, improved treatment delivery to TB clients and sustainable cost and other resource efficiencies for ARPHS. Nurses play a key role in driving the use of emerging technologies which improve service delivery models, while achieving positive outcomes for clients and the public health workforce. The need to continuously improve the quality and efficiency of client care within the context of a challenging economic environment is a key driver for the adoption of new technologies.

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An Investigation of Telenursing Assessment Content for Elderly Patients Living at Home: Analysis of Nursing Records by Text Mining.

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AIM

An increasing number of elderly patients require self-monitoring and -care at home owing to chronic diseases. In the present study, telenurses monitored data sent by patients and investigated the data inscribed when assessing trigger points established as indices for symptom exacerbation. The aim of this study was to investigate contents for self-care of the elderly patients with chronic disease to be assessed by telenurses.

METHODS

The researchers provided a 3-month telehome monitoring-based telenursing (THMTN) system for elderly patients with chronic diseases living at home near large cities. Once a day, subjects sent data regarding 22 items, including vital sign measurement and psychosomatic medical interview data. Telenurses assessed the state of each patient being monitored, and when necessary, they offered health advice or reported to doctors. These nursing records were analyzed by text-mining.

RESULTS

A total of 763 descriptions were obtained from the nursing records taken over approximately 3 months for four patients with diabetes mellitus (DM), four with amyotrophic lateral sclerosis (ALS), and one with chronic obstructive pulmonary disease (COPD) who were receiving THMTN support. As a result, seven assessment items related to trigger points were extracted. These were changes in number of steps taken, body weight maintenance, and blood pressure increase in DM patients; changes in pain, sleep status, and dyspnea and/or coughing in ALS and COPD patients; and physical listlessness in DM, ALS, and COPD patients.

CONCLUSION

Telenurse assessment content differed according to the characteristics of each chronic disease. Changes in sleep and activity before reaching individually-established trigger points were observed in addition to the degree of the patients' understanding of their own physical condition.

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Using group videoconferencing for social support: A social network analysis of the Telehealth Literacy Project.

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AIM

The aim of this study was to examine the changes in participants' social networks and their perception of social support after taking part in a 5-week group videoconference program.

METHODS

The Telehealth Literacy Project (THLP) was nested within a non-randomised, non-controlled, vital signs, NBN, remote monitoring project, based in the regional town of Coffs Harbour, New South Wales. Participants (n=52) self-selected to take part in a 5-week videoconference program, followed by a further week for feedback and evaluation. The program primarily aimed to deliver patient education on health literacy and chronic disease self-management and a secondary aim to develop social support between members. During the videoconference group sessions, participants and the facilitator could see and hear each other in real-time and simultaneously. Up to 7 participants were connected using customised tablets from their home. This was a mixed methods, prospective cohort study design which used a social network tool pre and post intervention to identify participants' social network members and their relationship to them across 3 domains of most, less and least important. Following the intervention, there were 4 focus groups, 2 of which were by videoconference and 14 semi-structured interviews. Evaluation compared changes in the social network tool and a thematic analysis of the interviews.

RESULTS

Of the 52 participants, 45 (87%) completed the social network tool at least once; 28 (54%) prior to the THLP; 41 (79%) post program and 24 (46%) completed the tool pre and post program. Post intervention data indicated increased membership of social networks, particularly friends and wider family, although no-one identified another THLP member. Companionship, emotional and informational support was obtained from group meetings and a feeling of being more engaged in life.

CONCLUSION

Using group videoconferencing to older people in their home has the potential to provide social support for people with chronic disease.

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Successful Client-centred Care in Tele-Audiology

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AIM

Conventional audiology is failing 75% of Australians who have hearing difficulties. The aim of this study was to develop and evaluate a cost-effective client-centred tele-audiology model that would help these people.

METHODS

A company was incorporated, products sourced from a partner organisation, and staff were hired and trained. New technology was developed for hearing testing [1], triaging clients, sound processing [2], hearing aid fitting [3], online data collection and reporting [4]. In parallel, a conventional audiology clinic was set up as part of the business. Statistical analysis of de-identified client data was used to evaluate the relative effectiveness of conventional and unconventional audiology methods [5].

RESULTS

Blamey Saunders evolved a variety of products and services including a purely online self-serviced model; a light-touch servicing model through regional pop-up clinics and pharmacies; and a clinic employing highly experienced audiologists. In 2015, approximately 50% of the company's revenue came from online sales and service, spread throughout the Australian states in proportion to their populations. The other 50% of revenue was from clinic clients, 75% of whom resided in Victoria. A single "super-clinic" in Melbourne accounted for approximately 1% of Australian hearing aid sales making it about 20 times more effective than the 1700 conventional clinics that accounted for the other 99%.

CONCLUSION

Individual clients differ over a wide range in their needs, degree of hearing loss, preferences and abilities. These characteristics can also change over time. We found it necessary to maintain a flexible system that can provide choices and guide clients to the most appropriate service. The system leads to a very high level of client satisfaction, industry-low return rates for hearing aids, and a highly cost-effective business that is disrupting conventional audiology and reducing the cost of hearing health for consumers and government.

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SFT-16
AUCKLAND

ORAL POSTER
PRESENTATIONS

The development of a Social Media Support Platform for Community Service Nurses in South Africa

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AIM

A number of challenges dramatically impede the effective delivery of health services in marginalized and rural areas. Many healthcare workers, such as community service nurses, lack access to information and knowledge and work in professional isolation during their first year of practice in the community after qualification. In this light it has been suggested to train and empower community service nurses and to strengthen their professional networks. The aim of the study was to develop a social media mobile support platform as an intervention for community service nurses in South Africa to decrease social isolation.

METHODS

A structured user centred intervention design was used with the following six phases: 1) an analysis of the needs and experiences of the target group (community service nurses); 2) an MHealth landscape analysis; 3) the selection of a scientific model to underpin the intervention; 4) The identification of the mHealth intervention components; 5) the development of the mHealth intervention package and 6) the development of the methodology to confirm the effectiveness of the intervention.

RESULTS

- 1) Needs analysis: Qualitative interviews on the experiences and support of the newly-qualified four-year trained professional nurses in Gauteng and Tshwane Districts (Tsotetsi, 2012 & Nkoane, 2015) revealed difficulties in the integration of theory to practice; lack of support in the clinical settings; role conflict and lack of clarity re scope of their practice; communication issues with staff; lack of orientation in new environment and lack of professional development in the setting.
- 2) The mHealth landscape review revealed that 80% of prospective nurses have smart phones and that WhatsApp was the most popular application used (80%) (Willemse et al, 2014).
- 3) The model selected to support the intervention was a Community of Practice (CoP) model as a recent review concluded that digital media can be conducive in facilitating virtual CoPs for health professionals through the development and maintenance of social capital (Barnett et al, 2012).
- 4) The mHealth intervention will be multi-component and provided on a WhatsApp platform and will include: a mobile app pocket guide, peer support and professional discussions, and access to a mentor ("call centre").
- 5) The intervention will be developed using a user-centred design process.
- 6) The mHealth intervention will be evaluated using a cluster factorial randomised design.

CONCLUSION

Using a structured user centred intervention design and evaluation process will be beneficial in designing a feasible and usable mHealth intervention package for community service nurses.

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The use of serious games and gamified design to improve health outcomes in adolescents with chronic disease: a review of recent literature.

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AIM

Poor adherence is commonly cited as a reason for treatment failure in adolescence. The use of game elements, within serious games and gamified applications, has been proposed as a way to improve engagement, adherence and hence the effectiveness of health interventions. This is particularly relevant to chronic diseases, where long-term adherence has been shown to influence clinical outcomes. The aim of this study was to explore, by way of a systematic review, (a) the outcomes of serious games and gamified application trials in adolescent chronic disease care, (b) types of interventions that have better outcomes, and (c) game design elements that have the best evidence to support their use.

METHODS

A search of 6 online databases was conducted to identify published articles, describing a primary study where the intervention involved an electronic game or gamified application for adolescents with a chronic disease.

RESULTS

In total, 12 studies were included in the review. 8 studies were RCTs, 3 prospective cohort studies and 1 used an interrupted time series design. Cancer, Asthma and Type 1 Diabetes were the most common population groups these interventions were trialed with. 5 studies showed a significant improvement in their primary outcome. Only 2 studies had the same primary outcome, and no studies reported using the same game or design elements. Health education interventions (n=5) were the most common intervention type trialed. Surprisingly only 3 studies were gamified applications, and the remaining 9 studies were serious games.

CONCLUSION

Although evidence relating to the use of serious games and gamified applications as a way to improve adherence is still weak, our review indicates that research in the field is maturing. In particular, behavioural interventions that promote self-care behaviours have evidence supporting improved efficacy when delivered within gamified applications. Despite growing interest in the field, more high quality evidence is needed before healthcare services can justify additional expenditure.

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Smart medicine box: a novel method of patient treatment monitoring.

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AIM

Timely use of medicine is an integral part of treatment of many diseases. Reducing drug consumption errors could play an important role in treatment. Increasing the accuracy and effectiveness of clinical care and medical therapy through continuous monitoring is the main objective of this system.

METHODS

In this study we created a smart medicine box by using telecommunications platform (internet - GSM (Global System for Mobile Communications)) and a pre-programmed electronic device equipped with an RFID (Radio-frequency identification) which can inform the patient about the times of drug use through light and sound alert. If the patient doesn't take his/her medicine, the smart medicine box will inform responsible people via SMS alerts. Clinician can change medicine plans remotely if needed. This system prevents medication errors using RFID technology.

RESULTS

Through this system direct supervision on taking medicine took place. If the patients didn't take medicine when the alarm rang, Physicians and nurses immediately became aware and actively reminded them.

CONCLUSION

This study is based on the principle of taking drugs in a timely manner. Smart medicine box enables the patient to timely consume drugs and also the medicine team is capable of remotely monitoring, planning and changing treatment schedules to improve treatment process.

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The use of telehealth in palliative care decision-making for rural renal patients.

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AIM

To describe how telehealth facilitated end-of-life decision-making for rural dialysis patients.

METHODS

The local satellite dialysis unit's geographic isolation from the main renal unit increases its renal patients' vulnerability, especially with their complex medical histories and need for frequent medical reviews. With only monthly clinics slots, timely clinical reviews and decision-makings can be difficult. We present two cases of rural haemodialysis patients requiring speedy end-of-life decisions and how telehealth facilitated this. The first patient had terminal bowel cancer. The second patient had terminal metastatic melanoma. Both patients had terminal incurable cancer, worsening quality of life and were not tolerating haemodialysis treatment. Both required urgent palliative end-of-life discussions, but were too unwell to wait until the next clinic review or to travel to the main hub. Instead, virtual video link (Cisco-Jabber) facilitated end-of-life care pathway discussions between the clinician (linking from the hub) and the patients, families and satellite nurses (linking from the satellite unit). In each case, meaningful discussion took place and a speedy unanimous decision was made. In the first case, haemodialysis treatment was terminated and the patient went to a palliative rest home. In the second case, haemodialysis continued, albeit only twice weekly but this soon ceased; the patient choosing to die peacefully at a relative's home. The implementation process utilised existing infrastructure; virtual video clinics were set up just weeks beforehand. Both clinician and nurses were already familiar with equipment and process.

RESULTS

The virtual interaction allowed patients and families to participate 'face-to-face' with the clinician for a meaningful discussion before making informed decisions. Appropriate and peaceful outcomes were achieved in both cases.

CONCLUSION

Virtual video meetings allowed end-of-life discussions with rural dialysis patients in a timely manner. It bridged inequalities in health due to geographic isolation and proved to be an invaluable conduit to enhance communication and clinical care.

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Considering telehealth when introducing an Electronic Medical Record.

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AIM

In 2016 the Royal Children's Hospital (RCH, Melbourne) was the first hospital in Australia to introduce Epic, as its organisation-wide electronic medical record (EMR). This was a major and multi-million dollar change initiative. The EMR included an optional telehealth video additional plug-in. The RCH reviewed this and decided to continue with their existing video call platform, which had several advantages over the EMR plug-in. The overall transition to Epic would be described as very successful. From a telehealth perspective, there were a number of small but crucial variances between in-person and telehealth consultations that weren't well understood or identified until post-launch. These variances impact on telehealth, with many now being addressed in Epic enhancements. The aim of this presentation is to share key lessons and considerations needed to support telehealth sustainability and future growth with the launch of an electronic medical record.

METHODS

During EMR planning, the EMR team met with all clinical departments and the telehealth unit to determine telehealth usage and needs. On launch, the telehealth program manager spent time observing the spectrum of service delivery including ward rounds, discharge planning, Specialist Clinics consultations, scheduling and billing - taking note of the interactions with the EMR from the perspective of considering, requesting, planning, scheduling, delivering and billing telehealth.

RESULTS

Telehealth was integrated in to the EMR according to feedback from individual departments and clinicians. However there were many unforeseen gaps, with 30 enhancements proposed post-launch. A summary of these will be discussed.

CONCLUSION

For most if not all health services, telehealth is a small part of overall activity. Individuals providing input or planning the EMR may have limited if any telehealth experience, or have a focused rather than whole-service perspective. Equally, without EMR experience, telehealth personnel may also be unable to fully understand or provide input in to EMR planning. This can make it very challenging for the team to usefully integrate telehealth in to all relevant aspects of a new EMR. The involvement of dedicated telehealth personnel in EMR planning from outset would help ensure the EMR is designed to support current and future delivery of telehealth.

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Attitudes of general practitioners towards the delivery of telehealth hepatology services in the Central Queensland region.

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6. Centre for Online Health, University of Queensland, Australia

AIM

Occupying more than 500,000 km², the Central and Central West Queensland region has unique challenges to deliver healthcare to its population of over 250,000 people. With no resident specialist hepatologist in the region, delivery of specialised liver clinics for the management of viral hepatitis is particularly challenging. Telehealth based models such as the ECHO model (Arora et al., 2011) integrate education and de-identified patient discussions, and have been proposed to increase non-specialist care of hepatitis. This study aimed to explore feasibility and acceptability of a hepatology telehealth program in regional Central Queensland.

METHODS

An online survey was distributed to general practitioners (GP's) in 3 rural Medicare Locals: Central Queensland, Darling Downs and South West Queensland. The survey consisted of five questions and was circulated to 58 GP practice managers registered within these Medicare Locals.

RESULTS

A 41% response rate was achieved (n=24). 83% of GPs (n=20) agreed or strongly agreed that specialist liver disease service was an unmet need in their practice. Over 90% of respondents (n=22) felt that regular hepatology telehealth service would improve their patients' care. 74% strongly agreed that they would benefit from a regular telehealth-based opportunity for liver and gastroenterological education, with GP's most interested in Hepatitis C with 87.5% (n=21). 67% felt case conference-type de-identified discussions about difficult cases was less of interest and benefit, while 33% did not.

CONCLUSION

Specialist liver services are an unmet need for GPs in central Queensland, and there is acceptability for regular telehealth based sessions for patient care and education. De-identified case conference/discussions appear less clearly attractive to GPs. It appears would be a useful method of supporting patients within these regions.

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Does using an 'online' geriatric assessment procedure for making triage decisions change the way Geriatricians use time to make clinical decisions?

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AIM

A study was designed to determine whether geriatric triage decisions made using comprehensive geriatric assessment (CGA) "online" (OL) are less reliable than face-to-face (FTF) decisions. It was identified that OL assessments were as reliable as FTF assessments. Using timing data collected during the reliability study, the aim is to compare the time taken by Geriatricians making triage decision (OL vs FTF) incorporating "online" CGA to consider any potential efficiency gains.

METHODS

In the multi-site non-inferiority prospective cohort study patients were allocated one FTF assessment and an additional assessment (either FTF or OL), creating two groups - paired FTF (FTF-FTF) or paired OL-FTF. In both groups, case preparation was conducted by a trained nurse assessor using a web-enabled clinical decision support system. Geriatricians allocated to perform an 'online' assessment had access to this information only. Geriatricians allocated FTF reviewed this data, as well as the paper-based medical file and then consulted directly with the patient and staff. Nursing time was not recorded as an identical process was undertaken for both. Timing was collected (for the FTF consultation) in three segments: reading the OL reports and other documentation (which is directly comparable to the OL consultation), reading the patient chart, and interacting with the patient.

RESULTS

The average timings for the paired FTF-FTF group: FTF1 - 26.05 min (9-52 min; 8.96 SD); FTF2 - 26.14 min (9-89 min; 11.68 SD). For the OL-FTF group: OL - 9.89 min (4-35 min; 5.83 SD); FTF - 27.73 min (4-77 min; 10.56 SD). In FTF consultations, less time is spent using the OL material when the geriatrician is aware that they will have access to the patient chart and need time to speak with the patient.

CONCLUSION

The OL assessment method is considerably faster, with no loss of reliability indicating a potential for increased efficiency. Considering travel, further increases the efficiency gains.

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Review study on mHealth for Headache Disorders

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AIM

Headache Disorders including migraine are the most common chronic diseases of the nervous system, which affect many aspects of patients' life because of its painful nature and disabling features. Although current literature has shown potentials for mobile health technology to manage chronic diseases and improve the quality of care, we were not able to find any review study on mobile health for headache management. The aim of this study was to summarise original studies on using mobile health for the management of headache disorders.

METHODS

We searched PubMed, Web of Science, Embase, and Scopus for studies reporting mobile health applications (apps) for managing chronic headache and migraine using different combinations of keywords for smartphone and headache. The electronic search was conducted in May 2016 and returned 745 records. After removing duplicates and screening at title/abstract level, we retrieved and examined full text of 29 relevant papers. Finally six papers met the inclusion criteria and were reviewed in this study.

RESULTS

We identified six papers reporting the use of mobile health apps for headache management and published from 2013 to 2016. Three studies were conducted in North America, two in Europe and one in Asia. All of the reviewed papers reported experiments with mobile-based diary for tracking and monitoring headache disorders. These studies have shown superiority of electronic headache diaries over paper-based diaries in terms of effectiveness and ease of use. In these studies, both patients and health providers participated in tracking and monitoring process via smartphone and web-based solutions. Moreover, mobile-based diaries as ubiquitous and real-time solutions have improved health care providers access to timely data, and satisfaction of the patients.

CONCLUSION

Patient's behaviors and lifestyle play important roles in triggering migraine and headache disorders. Mobile health can improve the management of headache as a reminder tool as well as an interactive solution for changing life style. Published papers on mobile apps for headache have focused on using smartphone as an e-diary and found it effective. Despite numerous mobile apps available for managing chronic headaches and migraine with a wide range of functionalities, few of them have been scientifically evaluated and reported in peer-reviewed journals.

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mHealth tool for energy balance

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AIM

The problems owing to the deficient nutrition and the metabolism processes have an effect on the imbalance between the energy intake from foodstuff and the energy expenditure [1]. Accumulated to 2014, about 1900 million adults were overweight and more than 600 million had obesity [2]. The previous, is a global health problem which requires solutions [3]. This work presents a mHealth tool which allows tracking the energy balance between energy intake and energy expenditure. **METHODS** The methodology starts off with the self-responsibility that people have with their own health. This tool is based on the registration of the food consumed and the measurement of the physical activity level, using apps managed in a central information system developed for Cloud Computing.

RESULTS

The results showed that in Colombia, users have empowered their responsibility of corporal weight self-care (culture); its use is greater in young and adults; the medical-care staff breaks the geographical distance gap with secure accessibility to information and continuous communication with the patients outside the health centers [5]; the continuous alarm generation are abided by the patients and reported to the medical-care person to take the respective actions and procedures.

CONCLUSION

In conclusion, the developed mHealth tool is applied, functional and accepted by the patients and medical-care doctors creating confidence between both parts; for the patients, their information is protected, available and up to date at the moment to be required by the medical-care doctor [6]. The solution that is set out, gives opportunities to new developments tending to increase the usability in teenagers and the elderly people.

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Telemental Health to Support Mental Health in a Remote Region of Afghanistan.

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AIM

Afghanistan's most recent 100-year history includes poverty, domestic violence, civil unrest, displacement, invasion, occupation, and war. About 60% of the population are scarred with undiagnosed and unaddressed mental health issues, with essentially no psychiatric support capability outside of Kabul. The Afghanistan Government recognises mental health as a major concern, but country-wide progress remains slow. The study aim was to design and implement simple and scalable conventional and e-Health facilitated interventions to address the four most common mental health issues; depression, psychosis, Post-Traumatic Stress Disorder (PTSD), and substance abuse. The study sought means of raising community and adolescent awareness and ameliorating stigma; building capacity of community and hospital healthcare workers; and improving referral processes.

METHODS

Control (3) and intervention (4) communities were identified in Badakshan Province of NE Afghanistan. Over a 3-year period, the team progressively implemented the planned interventions. Baseline and midterm evaluations were performed by the team, with a final evaluation by an independent contractor. The Government of Afghanistan was aware of and supportive of the initiative.

RESULTS

There were periods of heightened security when field teams could not continue work or visit sites. Despite such difficulties, comparison of baseline, midterm, and final evaluations shows positive impact. Community engagement and SMSs raised civic and adolescent awareness (respectively) of mental health disorders being treatable and manageable medical issues, a robust mobile application now empowers frontline health workers (project-provided smart phones offer decision support, build capacity through blended learning, and provide virtual teleconsultations and referral for service delivery), and videoconsultation to a Psychiatrist in Pakistan is available.

CONCLUSION

This project has successfully improved mental health literacy; reduced stigma; provided greater access to mental health services; extended community-based knowledge, outreach, and engagement; supported self-management of illness; and supported medication distribution. The solution is inexpensive and, with Government support, is primed for scaling.

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Models of care for Tele dermatology in Australia.

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AIM

To identify and discuss the models of care for tele dermatology in Australia.

METHODS

Models of care were identified by searches of current commercial services (in Australia and overseas), examining government service provisions, and through published research. These current and emerging tele dermatology models of care applicable to Australia were examined and categorised based on common factors such as image capture device, individual, disease state, funding model, end-point clinician and others. They were compared based on health economic principles such as costs (implementation and ongoing), funding source and potential outcomes.

RESULTS

Image capture can be performed using a mobile phone or digital camera by a consumer, or by trained staff in pharmacies, medical centres, or hospitals. Images can be transmitted through a mobile phone or online application. The technology can also be used to query or confirm diagnosis and treatment advice between a general practitioner and a dermatologist. In Australia varying models of care already exist; video-conferencing is subsidised through the MBS, and community pharmacies offer store-and-forward consumer funded services. Greater diversity exists in trial phases both inside and outside of Australia. Increasing international and Australian literature examines the clinical and economic impact of tele dermatology in varying models of care.

CONCLUSION

With increased availability and reducing prices of mobile devices with integrated cameras and ubiquitous internet access there is variability with how and by whom this form of service could be accessed and provided. These differing models of care provision each present unique advantages and disadvantages in terms of cost and effectiveness for the Australian healthcare consumer.

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The use of telehealth in impromptu medical consults for rural renal patients.

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AIM

To describe how telehealth facilitated impromptu medical consults for Rural Renal Patients (RRPs).

METHODS

The hub-and-spoke model is used to deliver clinical care over the vast catchment area of our renal service (with its widely dispersed satellite units). The units have either fortnightly or monthly clinic slots, manned by visiting nephrologists from the hub. However, the nature and complexity of these patients often necessitate urgent reviews which are difficult to arrange (without waiting for the next clinic or travelling long-distance). We present three examples of how telehealth facilitated urgent reviews of our RRP. In all cases, the virtual video link (Cisco-Jabber) was used: clinician (from main unit) video linked with patients and nurses (in distant unit), enabling impromptu consultations. The implementation process utilised existing infrastructure; virtual video clinics were established since 2014; both clinician and nurses were already familiar with equipment and processes.

RESULTS

Case 1: A visual assessment was made on a patient with lupus nephritis who developed a facial rash. This was deemed to be mild and no further action was taken (apart from giving out a sunscreen prescription); saving the patient a visit to the GP or Emergency Department.

Case 2: Swelling was found on the arm of a dialysis patient. The nurses sought an urgent review via the video link and the clinician deemed the case serious enough to warrant admission, investigations and inpatient treatment. The visual link enabled fast-tracking and prioritisation of this admission.

Case 3: A patient's dialysis fistula was visually assessed. Despite initial concerns of infection, the lesion was mild and the patient was treated only with oral antibiotics, averting the need for hospitalisation.

CONCLUSION

Virtual video consultations allowed near-instant snap consultations for problem-solving and urgency-stratification of cases amongst our RRP. This helped bridge inequalities in health for our RRP by enhancing communication and clinical care.

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Cultural adaptations and problems encountered in providing telediabetes services for Indigenous communities: A systematic review.

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AIM

To identify attributes, both positive and negative, encountered when providing telediabetes services for patients in Indigenous communities.

METHODS

A systematic literature review of peer-reviewed and grey literature was conducted in March 2016. Data sources included electronic databases PubMed, Embase, ATSI Health Informit and Scopus. Searches using combinations of keyword terms for diabetes, Indigenous communities and telehealth were used to identify relevant articles. Articles were included if they reported a telediabetes service involving an Indigenous community. Data describing positive or negative attributes of service delivery were extracted from included articles. All articles were appraised using the cultural identity interventions systematic review proforma and JBI levels of evidence. Findings were narratively synthesized and reported using the PRISMA guidelines. The review was registered with PROSPERO (CRD42016033151).

RESULTS

Inclusion criteria were met by 14 articles. There were six articles from Canada and six from Australia. 13 articles were descriptive publications (journal, abstract or report) with a JBI level of evidence score of four. Five articles reported cultural adaptations e.g. ceremonies held under the guidance of an invited spiritual leader before and after each clinic. The use of cultural adaptations was considered to be associated with improved patient attendance and satisfaction. Problems identified included: poor patient attendance, difficulty maintaining retinal camera equipment during long distance travel, local primary care staff lacking skills to operate equipment and variable environmental factors such as poor illumination. 6 (43%) articles were rated as 'low' for appropriateness of study design and 7 (50%) articles were rated as 'moderate' for ability to adapt findings to other Indigenous communities.

CONCLUSION

Successful delivery of telediabetes services within Indigenous communities requires appropriate community engagement and strategies which address the logistical challenges of providing telehealth. In the right circumstances, telehealth can be an invaluable way of engaging with people living in Indigenous communities.

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Development of the CRE in Telehealth Policy Digest.

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AIM

Commencing a telehealth service is challenging. One aspect is the development of appropriate policy documentation. Investigators from the Centre of Research Excellence (CRE) in Telehealth – www.CREtelehealth.org.au recognized the opportunity to support best practice policy development. The aim of this project was to establish an on-line database of Australian telehealth-related policy documents (single time-point).

METHODS

In October 2015 we conducted a search of databases and Gray literature to identify reviews of telehealth policies and policy documents produced by Australian Federal and State governments and health professional organisations. Retrieved resources were catalogued according to organisation and resource type. A content analysis was undertaken to report the dimensions covered by the resources.

RESULTS

Our search retrieved no published review of Australian telehealth policy documents, identified 100 resources and excluded 15 (strategy, industry and technical standards) leaving 85 resources for inclusion. The content analysis identified seven dimensions: appropriateness of technology-based consultation; professional practice; legal and regulatory; patient/clinical safety; privacy, confidentiality and security; business and change management; and practical and logistical aspects. The resource types included advice, guidelines, policy, position paper and standards. We posted on the CRE in Telehealth website a Policy Digest with links to the resources, which can be viewed by publishing organisation, resource type and/or dimension. Professional organisation resources covered the majority of the dimensions with professional practice the most frequent. Federal government resources focused on reimbursement policies and advice, whilst State and Territory government resources provided guidelines and advice.

CONCLUSION

Clinical practice and healthcare delivery using telehealth are multifaceted. The 'CRE in Telehealth Policy Digest' offers a comprehensive directory of Australian policy documents, an essential resource when creating or reviewing an organisation's telehealth policies. Additionally, it identifies which dimensions are well covered and points to potential gaps in Australian telehealth policy resources.

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Developing a Mobile Based Fuzzy Expert System for Diabetic Retinopathy Risk Estimation.

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AIM

Retinopathy is a common diabetes complication with high prevalence. Early diagnosis through continuous monitoring and durable self-management is crucial to prevent or delay the development of retinopathy and its disabling consequences. There is a need for a risk estimation system to determine the possibility of retinopathy development based on the most influential patients' data that can be collected and maintained by mobile health apps. This study was aimed to develop a mobile-based fuzzy expert system for diabetic retinopathy risk estimation.

METHODS

After pre-processing, de-identified clinical data from 400 ambulatory diabetic patients with retinopathy were analysed using fuzzy logic methods. Based on the literature, ten most influential variables (i.e. Age, BMI, blood pressure, HbA1c, FBS, diabetes duration, history of cardiovascular events, cholesterol, physical activity, TG and LDL) were utilised. Rules were generated based on the Fuzzy C-Means algorithm to construct the system's knowledge-base. Then, the approximate reasoning algorithm was designed to find the possibility of retinopathy development.

RESULTS

After 100 learning iteration in a training set, 8 main clusters were generated and for each cluster, one rule was extracted. Using the remaining data as the testing set, the possibility of retinopathy development, which is a figure between 0 and 1, was estimated. The low error value returned by the system indicated high efficiency of this method.

CONCLUSION

This mobile based system and its risk estimation capability can be used by: a) patients for improving their self-management through a diabetes mobile app, b) the diabetes care team to identify and actively follow up high risk patients who don't adhere with the management plan.

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POSTER PRESENTATIONS

ADOPTION OF MOBILE DEVICES IN THE AUSTRALIAN TELEHEALTH ENVIRONMENT: A PILOT STUDY

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AIM

Use of mobile devices is fast growing viable method of delivering health services but not used to its full potential in Australia. Therefore, the main aim of the research is to explore the perception and experiences of the healthcare professionals to understand the factors influencing adoption of mobile devices in the Australian telehealth environment and to build a conceptual framework. This research is a pilot study and has used focus group discussion technique for data collection.

METHODS

This research is based on subjectivist research philosophy and therefore researcher believes qualitative research design is suitable in this research. In qualitative design researcher has conducted pilot study using four focus group discussion sessions. In each discussion session 5-7 healthcare professionals such as nurses, registered nurses, oral health practitioners and management staff working in the telehealth environment had participated.

RESULTS

The results of this study indicates that the factors influencing adoption of mobile devices in the Australian telehealth environment are as follows: • Intention • Readiness • Functional features • Complexity • Social influences • Compatibility • Self-efficacy • Advantages • Disadvantages • Financial issues • Safety issues • Policies • Training

CONCLUSION

The results of the research indicates that various factors are influencing perception of the healthcare professionals for the adoption of mobile devices. This research indicates that factors such as intention, readiness, feature, social influences compatibility, self-efficacy, advantages, policies and training have positive influence while complexity, disadvantages, financial issues and safety issues have negative on the perception of healthcare professionals.

This research may contribute to the theory and practice for the use of mobile devices in the telehealth environment. The factors obtained in this research may be used by another researchers to understand the use of mobile devices in the Australian telehealth environment and can add to the body of knowledge. Further, the factors obtained in this research may be used to reform policies for the use of mobile devices in the telehealth environment. Moreover, the factors investigated in this research may be used by research community to further extend this research from other perspectives such as patient perspective. Hence the conceptual framework developed in this study may be enhanced in future research.

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Canterbury District Health Board TeleHealth Story: 5 years on

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The TeleHealth Service sits within the Medical Illustration Department located at Christchurch Hospital, New Zealand and was established to support adoption of video conferencing. Impetus for service is to support CDHB staff in delivering right care to the right person at the right time in the right place. Canterbury District Health Board (CDHB) and West Coast District Health Board (WCDHB) work closely to provide healthcare across the Trans Alpine Divide. February 2011 earthquakes provided the opportunity to relook at how and where healthcare is delivered. Drivers Patient centred Valuing Time Communication Collaboration Interconnectivity Efficient resource use Sustainability Carbon Foot Print Results Video Conferencing deployed in multiple locations and increased number virtual clinics operating. Introductory and tailored training sessions, just in time support and troubleshooting, regional special interest group established. Electronic data sharing. Multiple business/management meetings, and clinical teaching programmes. Patient consumer centred (reduced travel, stress, cost), extends availability of clinical expertise. Investment in primary and community services and new methods of care (e.g. video conferencing) have contributed to decreased bed demand. Feedback Integral, invaluable part of Geriatrician practice on the West Coast. Allows family to meet the local team prior to leaving Christchurch. Good opportunity for local team to hear medical information at the same time as the parents so that there is no risk of miscommunication. A critical part of post grad teaching programme (especially for PGY1 and 2s) is to enable access to teaching without travelling into the main hospital, which video conferencing enables. Video conferencing regular education sessions run from multiple sites has increased sharing of information. Recording sessions enables staff to watch at a later date. Enabled full attendance at Kaikoura Health Building project monthly meetings, negating 5hrs travel for a 2hr meeting for project stakeholders. Ensured the Nurse Manager able to function in role if medical emergency was to occur during those days. Cost of software solution paid for itself 10 fold. Excellent video and audio quality. Future Collaborative document development between CDHB and WCDHB including: Video Consultation Informed Consent Form, Patient information, Etiquette, Guidelines. Capital investment annual business cases to sustain and grow service. Usage reviews to support equipment location discussions. Increase video conferencing with the patient in their home setting. Grow health literacy with patient monitoring, reporting, and self-management. Online booking system, optimising equipment use and data collection. Introduce more use specific data analysis. Regular staff and patient evaluation.

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Evaluation of a telerehabilitation education program for Allied Health students: a pilot study.

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AIM

To evaluate the effectiveness of a telerehabilitation education program in developing student knowledge and self-perception of telerehabilitation as a mode of service delivery in allied health.

METHODS

Forty students were recruited as volunteers from Years 3 and 4 of the Bachelor of Physiotherapy and Speech Pathology programs and both years of the Master of Physiotherapy Studies and Master of Speech Pathology Studies programs at the University of Queensland (UQ). The education program consisted of self-directed online learning modules, quizzes and practical hands-on experience with telerehabilitation technology and hypothetical clinical cases. The program was delivered in the Telerehabilitation Clinic and was led by a clinical educator. The online learning modules included core knowledge and discipline-specific principles of telerehabilitation. Content included topics such as the drivers, benefits, and challenges of telerehabilitation, technology, practical considerations when implementing telerehabilitation, and research evidence for this mode of service delivery. Quizzes served a summative purpose only. Hypothetical clinical cases were used to facilitate the students' interaction with the hardware and software systems used in the clinic. Prior to and after engagements in the education program, students completed a self-perception questionnaire relating to their views and knowledge of telerehabilitation. Open-ended questions enabled students to provide additional information about improvements to the program.

RESULTS

Data collection is currently underway. Responses from the questionnaires will be analysed using repeated measures nonparametric statistics and descriptively. Responses to open-ended questions will undergo thematic analysis.

CONCLUSION

It is expected that students involved in this program will report a positive learning experience which will result in an increased understanding of telerehabilitation. This information will enable the TRC to optimise its education program in order to develop telerehabilitation expertise in future allied health professionals.

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