

Effectiveness of the Telehealth Training Approach
Compared with Face to Face Training for Rural
General Practitioners

By

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A thesis

Submitted to the University of Canterbury in
fulfilment of the requirements for the degree of
Master of Health Sciences

University of Canterbury 2013

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Acknowledgments

I would like to express my sincere appreciation to my two supervisors Associate Professor Ray Kirk and Dr. Arindam Basu. Thank you for all your encouragement and support throughout my journey. Additionally, Ray thank you for all your assistance reading through my drafts and giving me detailed feedback. Philippa Drayton thank you for the numerous administrative tasks that you undertook on my behalf, enrolment would not have been possible without your guidance. I would also like to thank Margaret Paterson for all her help with endnote and referencing. Thank you to Dr Tim Phillips for making yourself available and supporting me throughout my thesis. I would also like to thank all my participants who generously agreed to take part in my study; this would not be possible without all of you. I would also like to thank all my family and friends for their consistent support and for always showing an interest in my thesis and progress. I would also like to thank my amazing Wheki 251 and DE06 family for all the support and shared lunches. Finally, thank you to my amazing big sister Chloe Rosandich for generously giving up hours of your time to read through my thesis.

Abstract

Globally there is a shortage in supply of rural health professionals. Tele-health was developed to help reduce distance barriers for health professionals in geographically isolated locations seeking continued medical education (CME). E-health includes all health information and health care delivered electronically. Further, telehealth defines all telecommunication technology used to transfer health information and health care. Tele-health comes in a variety of forms including videoconferencing. The use of videoconferencing to deliver medical education for rural health professionals is expanding area for health education. Videoconferencing provides a flexible method for rural GP registrars to access CME without travel. However, there is limited knowledge surrounding the use and success of telehealth for medical education. Each new telehealth project requires evaluation in order to ensure effectiveness of future programs.

This study was based on one General Practice Education Year One (GPEP-1) registrar training program trialling videoconferencing as a method of teaching rurally distant registrars. A qualitative health research thematic analysis was undertaken. All individuals involved in the study were included in this research including; three offsite registrars (who teleconferenced as they lived remotely from the seminars), three onsite registrars (who attended the face to face seminars), and three facilitators. Three focus group interviews were conducted to collect data, one for each respective group. The focus groups accounted for the participant's individual and collective experience of teleconferencing.

Seven main themes emerged from the focus groups including; group culture, facilitation, teleconferenced education, technology, personal priorities, travel, and rural/remote. These themes were further sorted into two groups; reasons for switching to teleconferencing and factors that determine the success or failure of a telehealth CME. The

factors that influenced the offsite registrars reasons to switch to teleconferencing included; personal priorities, travel, and rural/ remote. Further, the other four themes determined the success or failure of the teleconferenced training including; group culture, facilitation, teleconferenced education, and technology. All seven themes were relevant for the offsite registrars and onsite registrars, however, for the facilitators only the factors that determined the success of teleconferencing were applicable.

Overall, the pilot study there was no difference in the educational experience provided. This study outlined the key factors that are required for effective teleconferenced training including; face to face bonding prior to teleconferencing, a skilled facilitator that provides active facilitation, a well organised structure, good quality technology, and regular checkups with the learners teleconferencing to ensure satisfaction. Additional research is required to replicate this study to compare this teleconferenced training with further teleconferenced training.

Chapter One

Introduction

Overview

Globally, there are over a billion individuals who lack accessibility to satisfactory health services due to the disparity in location of health workers (World Health Organization, 2013b). Rural communities have typically poorer health outcomes than their urban counterparts due to the uneven disparity in location of health professionals (Curran & Rourke, 2004). Further, rural healthcare services rely on a sustainable supply of healthcare professionals (Curran, Fleet, & Kirby, 2006). However, recruiting and retaining healthcare professionals to rural health practice is often complex due to distance barriers including; professional isolation and lack of education opportunities (Zollo, Kienzle, Henshaw, Crist, & Wakefield, 1999). Curran and Rourke (2004) stated there are two factors that influence recruitment of health professionals to rural regions; having lived rurally and long rural placements during undergraduate and postgraduate studies.

Tele-health was developed to provide medical care and information to geographically isolated communities (Doorenbos et al., 2011). The reported lack of support for distance learners during the 1990's demonstrated the need for change in distance continued medical education (CME) (Lawton, 1997). The term, e-health was developed in the late 1990s and evolved to define all health care information delivered online (Maheu, Whitten, & Allen, 2002). However, telehealth dates back to the 1900's when radio communication was used to deliver healthcare services to Antarctica (Maheu et al., 2002). The rapid growth in technology aids the development of telehealth success in all health related endeavours (Maheu et al., 2002). The factors contributing to the use of technology in CME include; flexibility, accessibility, and cost, however, these factors also double as barriers as well as, quality, time

and privacy (Sandars, 2011; Sandars & Schroter, 2007). However, recent technical advances have increased the quality of telecommunication technology at reduced costs (Smith & Curry, 2005). Videoconferencing technology is the most preferred form of delivering telehealth CME as it is real-time and interactive (Augestad & Lindsetmo, 2009).

Furthermore, policy makers require information on the cost effectiveness of telehealth programs in order to generate value for money (Hailey, 2005). Therefore, evaluation of telehealth projects needs to occur simultaneous to their operation in order to ensure the best value for money (Catwell & Sheikh, 2009; Sandars, 2011). The World Health Organization (2012b) assembled a toolkit to aid member states' Ministries of Health develop an individual e-health strategy.

Distance education

Distance education has evolved as an alternate, cost effective, method of providing education compared to traditional classroom learning (Ried & Byers, 2009). Traditional classroom education is often held as the golden standard; however, technological advances have radically changed distance education (Saturno, 1999). Distance education dramatically changes the role of the student from a passive learner to an active participant in their learning environment (Naidr et al., 2004). Further, the facilitator's role gains significance as active facilitation has demonstrated to have a positive impact on learner's outcomes (Wearne, 2003). While distance education eliminates barriers to learning for distance learners there are still major obstacles to overcome including; social interaction and bonding. Distance learning for CME is still evolving with multiple platforms capable of delivery (Ried & Byers, 2009; White, Krousel-Wood, & Mather, 2001).

Telehealth

Telehealth is defined as the use of communication and information technology to eliminate distance barriers to deliver healthcare and health education (Chang & Trelease, 2001; Doorenbos et al., 2011; Mair & Whitten, 2000; Ohinmaa, Hailey, & Roine, 2001). Telehealth reduces rural isolation as it allows for an increase in interaction opportunities for participants to collaborate (Doorenbos et al., 2011). Further, telehealth provides a vehicle for learners to discuss and transfer medical information. As technology advances so does telehealth and the minor technical issues are resolved (Doorenbos et al., 2011). Additionally, telehealth education permits distance learners to take advantage of the time they would have spent travelling, in traditional face to face training, with various other productive activities (Zollo et al., 1999).

Determining the success of telehealth

Establishing whether a telehealth project was successful can be difficult. Recent studies have demonstrated the strength of the evidence relies on the studies design; therefore, it is important to establish clear hypotheses and objectives when assessing telehealth projects (Mair & Whitten, 2000; Ohinmaa et al., 2001). Curran et al. (2006) claimed telehealth is an effective method in eliminating educational barriers for distance learners. Further, White et al. (2001) stated that telehealth promoted social networking through professional collaboration. The notion that online relationships are artificial is increasingly outdated due to the interactive technology available (Wearne, Greenhill, Berryman, Sweet, & Tietz, 2011). Further, Wearne (2005) suggested that relationships established via telehealth are more valuable than traditional classroom relationships as online technology offers flexibility. Telehealth provides learners with the flexibility to determine the kind of relationship they desire based on their educational needs.

Telehealth is also financially appealing to distance learners and providers as the technology is increasingly more affordable (Kun, 2001). Additionally, there are other cost advantages provided by telehealth, including reduced travel costs for the learners. Travel costs not only include transport but the carbon cost to the environment (Brownsell, 2009). Therefore, telehealth programmes are best situated in geographical locations where the cost of setting up and running the project outweighs the cost of traditional face to face training (Whitten et al., 2002). Establishing rural telehealth programmes, which no longer require learners to travel, effectively cuts carbon costs and provides a healthy, environmentally friendly method for delivering CME. The overall savings of a telehealth programme, especially in terms of cost, depends on its unique characteristics. The National Health Service (NHS) reported that travel was responsible for 18% of annual carbon emissions (Brownsell, 2009). Therefore, the use of videoconferencing for distance CME reduces learner's carbon emissions and effectively the programme's carbon footprint.

There are a variety technological channels which telehealth is delivered including; audio, video, and computer technologies (Barker, 2003). Further, telehealth outcomes vary due to the quality and technology channels used. Face to face training is viewed as the golden standard for education delivery largely due to level of social interaction (Carroll, Booth, Papaioannou, Sutton, & Wong, 2009). Therefore, the most social interactive form of telehealth education is the most preferred choice for distance CME.

Videoconferencing

Telehealth programmes are only as good as the technology they use. Videoconferencing is considered as an effective method of delivering real time, interactive health education to distance learners (Doorenbos et al., 2011). Recent technological advances have marketed videoconferencing as a financially appealing education tool for delivering

distance education (Augestad & Lindsetmo, 2009). Videoconferencing allows learners in different geographical locations to interact live in real-time, thus eliminating geographic barriers, as well as travel and time costs (Augestad & Lindsetmo, 2009). Van Ast and Larson (2007) stated that videoconferencing supported similar levels of interaction to face to face learning. However, Murphy-Southwick and McBride (2006) found that the most popular approach to telehealth is a hybrid including both traditionally face to face learning opportunities alongside videoconferencing. Videoconferencing provides an outlet for education providers to deliver online distance education that is as effective as traditional face to face training (Doorenbos et al., 2011).

Significance of the study

The total population of New Zealand is currently estimated at 4.4 million; with 85% living in urban centres and the remaining 15% living in rural regions (World Health Organization, 2009a). The rapid accessibility of broad band Internet access in rural regions nationwide eliminates the barrier of accessibility to telecommunication technology (Janes et al., 2005). Further, distance regularly acts as a barrier to rurally located individuals seeking higher education as all major tertiary and higher medical education providers are located in urban centres. In New Zealand telehealth has the opportunity to improve rural CME as it eliminates distance barriers (Kerr & Norris, 2004). However, currently there is a lack of literature concerning learners' experience with distance CME in New Zealand with the focus on e-health patient care. The rapid growth in telehealth projects and accessibility to telecommunication technologies across New Zealand requires attention. New Zealand's National Health IT Board was established as a sub-committee of the 2009 National Health Board under section 11 of the New Zealand Public Health and Disability Act 2000 (New Zealand Ministry of Health, 2012). The role of the National Health IT Board is to supervise

and guide all information systems in the New Zealand health sector and review investments and administer grants (New Zealand Ministry of Health, 2012). Kerr and Norris (2004) reported the swift growth in telehealth projects highlighting the need for evaluation in order to improve future programs. Day and Kerr (2012) state telehealth as an effective method of delivering health care at a distance, thus reducing the patients or clinicians need to travel. Further, Day and Kerr (2012) outline three effective outlets of telehealth that support CME for distant learners including; videoconferencing, telephone, and social media. There is limited research on facilitators and other face to face learners' perception and experience with tele-education worldwide.

Pilot study

This thesis focuses on one group of first year general practice registrars as part of a telehealth pilot to study the effectiveness of videoconference based distance education compared to traditional face to face training. The main educational goal of the General Practice Education Programme (GPEP) is to transition registrars from hospital based health care to the community-based model of health care. The standard full-time GPEP training includes, 36 months, separated into two stages; GPEP1 and GPEP2. In New Zealand the first year General Practice Educational Programme (GPEP-1) registrars are put through an intense 10 month training programme. The GPEP seminar curriculum consists of 35 topics including; acute care, addictions, adolescent/Rangatahi/youth health, cardiovascular, certification, communication, dermatology, e-health, ear, nose and throat, end-of-life care, endocrinology, eyes, family violence, gastroenterology, genetics, health and work, long-term conditions, Maori health, men's health, mental health, musculoskeletal, neurology, nutrition older people, oncology , paediatrics and immunisations, population and public health, prescribing, renal

and urology, respiratory medicine, rheumatology, rural, sexual health, travel medicine, and women's health.

The GPEP consists of two major training components; clinical placement and day release seminars. The registrars undergo a clinical placement where they see patients and receive one-on-one supervision from a GP teacher for a minimum of 1.5 hours a week. The GP supervision is important part of training as it allows for the registrars to review and discuss patients and problems as well as ask questions. Each registrar is also required to attend a day release seminar once a week in small regional groups. The day release seminars follow a strict structure of training on core topics and clinical skills, as well as providing registrars with the opportunity to review and discuss their individual practice experiences with peers and trained facilitators. Registrars enrolled in the programme spend the rest of their week working in a practice with real patients. There is a limited amount of training facilities around New Zealand and the closest training centre to certain registrar practices can often be a long commute. The time registrars waste travelling to and from these training centres could be used for more productive activities such as patient care or study. Therefore, distance education offers a platform for registrars to maintain study while reducing time wasted travelling. The flexibility of telehealth allows for the seminars to be carried out via distance in real-time for the distance registrars who cannot easily attend face to face.

One GPEP-1 training region in New Zealand in 2012 piloted the use of teleconferencing for three registrars that were unable to attend the day release seminars. This study focuses on the six registrars and the three facilitators involved in the GPEP-1 telehealth pilot. This study consists of three separate groups; the offsite registrars (the three registrars that were unable to attend the seminars due to their geographical location), the onsite registrars (the three registrars that attended all the seminars face to face), and the three

facilitators (one course coordinator, one onsite facilitator, and one offsite facilitator). For the first three months of the year all six registrars attended the weekly training seminars face to face. For the remaining seven months the offsite registrars used a teleconferencing unit based at the offsite hospital to connect with the seminars. The onsite registrars attended all seminars face to face. This pilot study required a formal evaluation including; the effectiveness of the telehealth training in terms of educational experience and social bonding. This research is the first of its kind looking at GPEP-1 registrars and facilitators to determine the effectiveness of telehealth training for educational experiences and social bonding.

Study design

This was a retrospective qualitative health research study involving thematic analysis. This study included data from the GPEP-1 registrars and facilitators collected during three focus group interviews. This study involved qualitative data analysis from the three focus group interviews. The focus group interviews were recorded, transcribed, and then analysed for common themes. Thematic analysis was used to identify principle themes by merging themes that were interrelated into broader themes (Carroll, Booth, & Lloyd-Jones, 2012). This study followed Braun and Clarke's (2006) six step guideline to thematic analysis to ensure valid and reliable results.

Objectives of this study

The main purpose of this study is to compare the effectiveness of the telehealth approach with traditional classroom, in terms of clinical and educational learning experience, CME training in one of the regional New Zealand General Practice Education Programme (GPEP-1 training programme). Further, this study investigated the advantages/ disadvantages of the telehealth approach in regard to social networking for the registrars and facilitators.

The specific aims of this thesis are:

- (1) Does telehealth/ distance based training offer equivalent or improved clinical/educational experiences, compared with traditional face to face training, for GP Registrars in the General Practice Education Programme (GPEP-1 training programme)?
- (2) What are the advantages/disadvantages of telehealth compared with face to face training, with specific reference to social networking?

Overview of the thesis

This introductory chapter introduces the background of telehealth for distance education and accounts for the current use of telecommunication technologies. Further, the introduction provides an overview of the pilot study being assessed, the significance of this study, and the study objectives. Lastly, the introduction provides a brief overview of each chapter.

Chapter Two provides an overview of the evolution of e-health and the emergence of telehealth technologies including teleconferencing. The Literature review documents the guidelines for implementing telehealth systems provided by the World Health Organization (2012b) and follows the use of telecommunication technologies from a global world view. Further, the literature review focused on the use of telecommunication technologies for health education with specific reference to; the United States, Canada, the UK, Australia. Additionally the literature review examines the use of telecommunication technologies for health education in New Zealand, thus, providing a rationale for this study.

Chapter Three includes a detailed account of the process and reasoning for choosing the methodology applied in the current study. Further, the methodology chapter outlines; the aim, purpose, design, and procedure of this study in terms of data collection and analysis.

Chapter Four reports the findings from the three focus group interviews. The results detailed the seven main themes that developed from the focus group transcripts following Braun and Clarke's (2006) six step guideline to thematic analysis. The results are presented in level of importance, with the most important presented at the start.

Chapter Five presents the key findings from the focus group interviews and demonstrates how they relate to previous literature findings. Further, the studies; limitation, implications, and future recommendation are presented.

Chapter Two

Literature Review

History of e-health

E-health has evolved for over a 100 years. It was born from a need to provide medical care and knowledge to those in geographically isolated communities (Doorenbos et al., 2011). E-health or electronic health defines any health care and education provided in electronic form. Wootton (2001) stated telemedicine as the original term used to describe all distance health-care. Nevertheless, telemedicine has been replaced by terms such as e-health and telehealth. The term e-health originated in the late 90s and evolved to define all health care delivered via the internet (Maheu et al., 2002). One branch of e-health is telehealth, which is often defined as the incorporation of telecommunication for health protection and promotion (Mair & Whitten, 2000; Ohinmaa et al., 2001). According to Maheu et al. (2002) the use of telecommunication technology for health predates the Internet. Telehealth can be traced back to the 1900's when radio communication was used to provide Antarctica with a medical service, and in 1950 when the first radiological images were sent between West Chester and Philadelphia (Maheu et al., 2002). In the late 1950's the first interactive video conferencing occurred in a Nebraska Psychiatric Institute, its purpose included; education, specialist treatment, and consults between specialists and GP's (Maheu et al., 2002). Further, Yellowlees (2005) outlined the chronological order of telehealth experiments and their outcomes from the 1960s-90s; during the 1960s-70s the majority ended in failure, in 1980s very few experiments were conducted, and by 1990s telehealth was revived due to the price decreases to technology and the improved quality. McLaren and Ball (1995) agreed that the emergence of telehealth studies appeared in the 1960's with an ongoing resurgence each decade since. The growth in technology supports the growth in e-health and allows patients and professionals to connect in new ways via the Internet (Maheu et al., 2002).

Tele-education

Telehealth has an important role to play in the 21st century health care system. One sub section of telehealth is tele-education, the use of telecommunications technology for education. Technology has since advanced to offer more than over the phone education with the use of real time interactive video conferencing. There are a variety of factors that contribute to the attraction of using technology in health education including; flexibility, accessibility, and cost (Sandars, 2011). However, barriers such as quality, accessibility, cost, time and privacy, need to be addressed in order for health organisations to integrate tele-education (Sandars & Schroter, 2007). Evaluation of tele-education programmes needs to be simultaneous to their development as poorly designed programmes have the potential to squander large sums of money (Catwell & Sheikh, 2009; Sandars, 2011). Typically tele-education programs require costly short term financial backing for future long term economical gains (White, Krousel-Wood, & Mather, 2001). Further, the success and satisfaction with tele-education varies due to the nature of the technology used (Cobb, 2011). However, when implemented successfully tele-education programmes have the potential to provide copious amounts of medical information that is highly accessible, at a minimal cost (Maheu et al., 2002). The effectiveness of tele-education or online continued medical education (CME) is well supported by a full body of literature (Freeman, 1995; Olmsted, 2002; Russell et al., 2007). The flexibility of tele-education has solved the distance barrier associated with continued and advanced training of rural based medical health professionals (Chen, Su, Wu, Shieh, & Chiang, 2011). The cost of implementing tele-education programs is the biggest barrier to deployment of telehealth. Policy and decision makers need demonstration that tele-education is a superior option compared to the traditional classroom delivery of CME. Pelayo et al. (2011) state the success of tele-education is well recognised

and should no longer be compared with traditional classroom environments but rather other internet based education strategies.

Rural health care

Globally, rural communities have a short fall supply of primary care physicians and therefore rural health services are often of a lower standard than their urban counterparts (Curran & Rourke, 2004). Further, rural populations are generally; poorer, older, less educated and have lower levels of health compared with urban populations (Curran & Rourke, 2004). Internationally, recruitment and retention of rural health care professionals is a key issue (Curran et al., 2006). There are two elements contributing to recruitment of health professionals to rural regions; coming from a rural community and longer positive placements in rural practice in undergraduate and postgraduate courses (Curran & Rourke, 2004). Maheu et al. (2002) stated online CME is aimed to reduce professional isolation and stress associated with rural and remote practicing medical professionals. Practicing family medicine in rural communities is markedly different to urban regions. Rural practice is uniquely broader in scope than urban practice (Campbell, Greacen, Giddings, & Skinner, 2011). The small quantities of rural medical professionals are isolated with fewer support networks and therefore they are required to maintain a greater range of medical skills. Physicians with more knowledge and experience of practicing rurally often feel more prepared to commit to life as in rural practices. Schoen et al. (2009) conducted a randomized controlled trial (RCT) with 13.2% out of 1337 qualified physicians signed up to this study. The study aimed to investigate the specific characteristics that determine participation in online course. The participants were sorted into two groups; intervention web sites or a controlled website. Schoen et al. (2009) found the two best predictors of enrolment of physicians in a voluntary online course included; whether the course content was relevant to

their own patient lists and if they were from a rural practice. Therefore, in order to recruit family physicians to rural practice, rural placements need to be implemented in undergraduate and postgraduate training. Due to the low enrolment rate the results are limited to the biases of the few physicians that participated. However, tele-education provides rural and remote medical professionals the option of participating in CME at a distance using teleconferencing (Cunningham & Stamm, 2005; Maheu et al., 2002). Further, tele-education delivers support and accessibility to a wide range of education and medical resources to help improve the delivery of rural CME and thus improving the overall health of people living in rural communities (Maheu et al., 2002). Consequently, by improving rural health professionals' knowledge and education this positively effects the health status of rural communities (Cunningham & Stamm, 2005).

Online learner

In the late 1990's there was a reported lack of support available to distance learners and the need to implement change was apparent (Lawton, 1997). New technology has since offered distance learners with support and opportunity with the delivery of CME. There is an increased interest in online CME for distant students as it offers a flexible way to study. Further, recent innovations to telecommunication technologies provide high quality at a reduced cost (Smith & Curry, 2005). There are many uses of technology in health education that range from uploads of power points to interactive video conferencing. Online learners typically prefer tele-education courses that are similar to the traditional classroom experience. Thus, video conferencing is the most preferred tele-education technological tool as it is live, real-time, and interactive with the ability to bridge the distance between training sites and distant medical professionals seeking CME (Augestad & Lindsetmo, 2009). Further, video conferencing is a cost saving method for distance learners seeking CME (Sandars, 2011).

Typically, findings demonstrate higher enrolment figures in rurally located participants for online CME as value for money is greater in rural regions (Schoen et al., 2009). Video conferencing equipment has recently developed as less expensive and more user friendly (Augestad & Lindsetmo, 2009). Wootton (2001) also supported video conferencing as the most capable facet of distance tele-education; however, the major barrier to adoption is changing health organisations attitudes towards health technology. There are no significant educational differences between online and traditional classroom learning; there are strengths and weakness with both (Shovein, Huston, Fox, & Damazo, 2005; Wells & Dellinger, 2011). A major strength of the use of video conferencing for CME is that it helps to connect distance students, who would not have been able to study, with advance medical education. However, to ensure value for money and purpose, tele-education outcomes should be the same if not better than traditional classroom outcomes. Tele-education is generally more cost demanding in the initial set up and therefore has to prove invaluable compared to the traditional methods to health education in order to develop and cement its hold in health education (Hailey, 2005). Further, tele-education is an effective method of CME as it produces similar academic results to traditional classroom training while reducing costs for learners (Midmer, Kahan, & Marlow, 2006).

A direct disadvantage associated with tele-education is isolation through lack of face to face communication with the facilitator and other learners (Wells & Dellinger, 2011). The lack of face to face interaction can leave learners feeling isolated; however, timely response to learners seeking support helps reduce levels of isolation (Smith & Curry, 2005). Barker (2003) warned of the use of technology as simply a method of delivering course material. Bridging the geographical distance, while maintaining a high standard of education, is the key component to distance education (Kennedy, 2002). Therefore, success of tele-education programs depends on the facilitator's ability to use that tool to deliver quality education.

Online courses require a more active role from the facilitator to help foster learner participation and inclusion. The role of the facilitator and the learner changes as active facilitation and participation are required in order to create a sense of community online (Shovein et al., 2005). Further, interactions between learners and facilitators play a key role in educational satisfaction (Wells & Dellinger, 2011). Distance supervision introduces a flow of knowledge into rural regions but creates more pressure for the facilitator to ensure all learners are actively engaging (Wearne, 2011). Naidr et al. (2004) piloted a study that researched retention of course information of 38 online distance medical students from Charles University, Prague. After a year of online medical education each participant was given one hour to complete a 60 multiple choice test and a year later 31 of the original participants retook the test. The findings demonstrated 67% of knowledge was retained after one year with a positive correlation between number of hours spent at the computer weekly and retention knowledge (Naidr et al., 2004). However, there was no control group to determine whether the delivery of information affected retention a year later. Nevertheless, facilitators are responsible with preparing learners for their future roles and therefore need to directly observe learners and tailor facilitation to meet their educational needs (Wearne, 2011). Smith and Curry (2005) stated that online learners needed multiple support structures as poor facilitation is associated with increased dropout rates. Conversely, Kennedy (2002) states geographical distance is not a barrier to distance learning as distance students often receive more support than their classroom based counterparts as teachers attempt to eliminate the stigma associated with distance education. Midmer et al. (2006) conducted a randomised controlled trial (RCT) involving 88 family physicians that attended one of four CME courses determining the success of email case discussions. The study focused on prescription of opioids and benzodiazepine. Every participant underwent a pre-test and was then separated into one of two groups; control group and intervention group. The intervention group

participated in 10 weeks of email discussions surrounding opioids and benzodiazepines prescriptions. A mock telephone consultation post-test revealed an improvement in level of optimism with both groups surrounding treatment outcomes, however, the intervention group asked more questions and offered more advice. Online educational experiences have to be interactive for the learner in order to develop a sense of community, simple and cost effective e-mail discussion demonstrate usefulness (Midmer et al., 2006). Increasing the interactive social aspects of online learning consequently demonstrates positive outcomes and experiences for learners.

The explosion of technology has led the way to an increase in the use of technology for health care and education. Researchers assessing the value of technology in health education have been predominantly focused on online learners academic achievements compared to their traditional classroom counterparts. The concept of sense of community of online learners is gaining credit; however, there is a lack of literature focused on factors that contribute to online learning (Reilly, Gallagher-Lepak, & Killion, 2012). Literature provides evidence to the argument that there is no significant difference in academic achievement for online learners; however, emotions are now recognised to affect a person perception of situations and regulate their knowledge intake (Reilly et al., 2012). There are steady improvements in the interaction and communication online with video conferencing offering an experience most similar to face to face. Mayne and Wu (2011) supported this statement and claim social presence as the key factor in building a sense of community. Cobb (2011) also agreed stating levels of 'real' interaction affect the learner's satisfaction with traditional classroom, however, online learners and overall satisfaction with online courses increases overtime. Cobb (2011) used a descriptive correlation design to collect survey data from 128 nursing students taking online courses. However, there was a 43% response rate with 79% of the responding individuals older than 40 years old and 94% female. The results reported

significant correlations between satisfaction, social presence, and instructor performance. Further, establishing a sense of community is important in learner's perceived learning (Cobb, 2011). E-learning usually requires learners to take a more active role in their learning compared to traditional classroom teaching (Pelayo et al., 2011). Increased interaction enhances a sense of community and reduces feelings of isolation and increases students' online participation and effectively their academic outcomes. Consequently overall success in online courses depends on social presence with greater social presence associated with higher academic success (Mayne & Wu, 2011).

WHO on e-health

The World Health Organization (WHO) (2013b) states over a billion individuals lack accessibility to acceptable health services largely due to the geographical allocation of health workers globally. WHO (2013b) also states there is a shortage of health workers worldwide, however, increasing the numbers will not suffice improving the medical knowledge and clinical experience is needed to improve health status globally. Diverse populations worldwide require diverse medical attention and therefore increase the demand on medical professionals. WHO advocates for an increase supply of rural health workers through training opportunities in rural areas (Wolstencroft & Macvicar, 2011). WHO (2013b) is looking at alternative options to help increase the quantity and quality of the health workforce globally with tele-education as a possible contender. WHO (2012b) compiled a toolkit for Ministries of Health worldwide outlining the development of an e-health strategy. The toolkit was to act as a guideline for each member state and individual Ministries were advised to tailor it to meet their national health expectations (World Health Organization, 2012b). WHO (2005) stated seven guidelines to consider; long-term strategic plan, reduce current health costs, collaborate with private and non-profit sectors, reach communities, ensure privacy, equity

and equality, coordinate policies for best practice, and develop e-health systems to address disease and health emergencies. WHO (2013a) stated only 36% out of 170 countries analysed had policies surrounding health technology as part of their National Health Program. WHO (2012a) signified the importance for each member state of WHO to develop a national e-health programme. WHO and the International Telecommunication Union (ITU), as major organisations under the umbrella of United Nations (UN) in public health and information and communications technologies respectively, are working together to support countries assembling national e-health strategies (World Health Organization, 2012a). The expectation for health care has risen as technology advances and therefore WHO urges member states to develop national e-health strategies to help meet national health goals (World Health Organization, 2005). Member states are invited to share their success and failures in e-health to help provide support and clearer guidelines for future endeavours (World Health Organization, 2012a).

Global e-health guidelines

The development of tele-education has changed distance health education globally. The need for tele-education is critical in rural and remote locations globally in order for health systems to thrive. Tele-education programmes need to demonstrate cost-effectiveness regardless of the country. Cost-effectiveness of tele-education services needs to be accurately detailed so policy makers can develop telehealth programs that generate value for money (Hailey, 2005). However, telehealth projects are predominantly funded as short term projects, which presents a problem as they are distinctively different to long term project but are meant to project the value of long term projects (Whetton, 2005). While individual studies provide useful insights for decision-makers, informed decisions should evaluate the differences and similarities from a combination of similar studies to draw significant conclusions of the

overall health-care outcomes (Whetton, 2005). Internet based education has proven to save up to 50% of cost compared with traditional classroom based education in the non-medical literature (Waldorff, Steenstrup, Nielsen, Rubak, & Bro, 2008). However, Waldorff et al. (2008) investigated the uptake of an e-learning program introduced to Danish GPs nationwide and found few made use of the programmes. Further, Whitten et al. (2002) systematically reviewed 612 English journal articles on cost benefit studies of telemedicine. Only 24 articles qualified for inclusion and the findings supported claims that cost effectiveness varies depending on the system being evaluated and other individual aspects. There was little evidence to suggest the cost effectiveness of telemedicine for the delivery of healthcare, however, the researchers neglected to investigate cost effectiveness of telemedicine for the delivery of health education. Further, Ohinmaa et al. (2001) reviewed international telemedicine applications with special reference to Finland and Canada and their conclusion suggest the level of utilisation of the technology depends on the cost. Distance education allows medical students to study regardless of their geographical location and flexibility allows them to study and work simultaneously as they no longer have to travel on campus thus reducing their costs (Williams-Green, Matthews, Paul, & McKenzie, 2007). Distance education is a valuable tool for geographically isolated regions where health care and well trained professionals are required (Williams-Green et al., 2007). There has been a global shift in the methods used to educate medical students (Margolis, Davies, & Ypinazar, 2005). Countries worldwide have developed committees and organisations to oversee the implementation of telehealth to meet the specific health needs to their region (Robinson, 2002). The focus of telehealth needs to be directed to the integration of technology into the health care system in order to improve the effectiveness and efficiency of health education globally (McLaren & Ball, 1995).

E-health in the United States

The United States (US) spends more on health care than any other country; however, they fail to obtain the best health outcomes (Kun, 2001). There is a push in the US to improve health while decreasing health expenditure. Telehealth presents as an ideal platform for future healthcare in the US as it delivers the same quality healthcare, with greater efficiency and accessibility, at a reduced cost (Kun, 2001). Technological advances in the late 21st century have provided the same educational experience of a traditional classroom at a distance (Russell et al., 2007). CME has been dramatically reshaped via the Internet (Schoen et al., 2009). The cost of setting up telehealth technology is costly, although, as technology evolves it becomes more cost effective and tailored to the health sector (Kun, 2001). White, Krousel-Wood, and Mather (2001) note the use of the Internet has exploded especially in its role in communication in the US. Healthcare in the US has taken advantages of Internet with the steady growth of telehealth programs, specifically distance education of rural health workers. Zollo, Kienzle, Henshaw, Crist, and Wakefield (1999) used data collected from a study from the University of Iowa and noted there were high expectations for tele-education; nevertheless, utilisation was much lower than expected as rural budgets could not cover the cost of the technology. Murphy-Southwick and McBride (2006) conducted a study from the state of Montana, a predominantly rural state, focused on short supply of rural geriatric health professional. Participants included 269 health professionals recruited between 2001 and 2004 as they attended CME courses at the Montana Geriatric Education Centre (MGEC). The study used survey questionnaires to investigate the need for geriatric training and the best method of delivery of CME. Attendance to the MGEC training doubled in 2004 from the previous year, when video conferencing was offered alongside face-to-face training (Murphy-Southwick & McBride, 2006). However, it was reported that a face to face one day conference was the most effective method for attracting health professionals to the MGEC

(Murphy-Southwick & McBride, 2006). The findings suggested the cost associated with travel to training seminars was the biggest barrier to CME and supported telecommunication technologies as a cost effective method for increasing the supply of rural geriatric health workers (Murphy-Southwick & McBride, 2006). Further, by 2010 online CME was extremely popular in the US with over 40% of physicians preferring it to face-to-face instruction (Wearne et al., 2011).

In the US telecommunication technologies have been established as a successful method for transmitting information between health professionals and reducing professional isolation. Zollo et al. (1999) noted it is difficult to recruit and maintain health care practitioners in rural areas of the US. Professional isolation and lack of CME for rural health practitioners is a major concern (Doorenbos et al., 2011). As technology improves so does tele-education and effectiveness of telehealth. Video conferencing is proven an effective method for delivering cost effective CME. Video conferencing supports real-time communication between participants similar to face-to-face (Doorenbos et al., 2011). Reilly et al. (2012) conducted a qualitative study including 18 nurse registrars who had completed at least two online courses from Wisconsin State University. The aim of the study was to collect nursing students experience and perception of community using telephone administered focus groups. Study findings suggested increased communication online fosters a stronger sense of community and negative emotional experiences can impair learning if not actively facilitated (Reilly et al., 2012). Majority of the participants were female and 50% were over 45 years old similar to Cobb (2011) demographics. Video conferencing supported meaningful discussion with healthcare specialists and other providers, thus potentially decreasing professional isolation and enhancing interdisciplinary collaboration (Doorenbos, Kundu et al. 2011).

In rural parts of America accessibility to high speed Internet was a significant problem especially from 2004 to 2006; however, Internet accessibility is improving annually (Schoen et al., 2009). It was originally predicted that rural uptake of online courses would be lower than urban regions as high speed Internet is more accessible in urban areas (Schoen et al., 2009). However, the flexibility of video conferencing has allowed for the use of communication technologies in a variety of major health concerns across the US with a predominant focus on rural regions. Obesity is a major health concern in the US, with rural regions reporting greater numbers than urban regions (Patterson, Moore, Probst, & Shinogle, 2004). Shaikh, Nettiksimmons, and Romano (2011) administered a cross-sectional survey investigating the use of telehealth for childhood obesity care in California, 135 health professionals took part with the majority working in low-income rural communities. Health providers noted a very high interest in using video conferencing to support health care professionals in rural communities with obese management (Shaikh et al., 2011). This study was limited to health provider's perspective and perceived interest in using telehealth technologies for CME and not their actual experience. Three quarters of the participants reported previous use of telehealth for education, however, the extent of use was unclear (Shaikh et al., 2011). Further, Chang and Trelease (2001) reported the use of video conferencing for training student nurses also located in rural California where distance barriers excluded them from face-to-face education. Use of video conferencing in the US health sector has helped aid health goals across rural regions by providing alternative methods for CME.

Throughout the US universities and colleges offer courses entirely online and while the majority of the literature focuses on students experience more focus is also needed on the quality of education being provided (Russell, Barefield, Turnbull, Leibach, & Pretlow, 2008). Russell et al. (2008) conducted a meta-analysis on GPA scores of 31 students, 17 on-campus

and 14 distance, and results established no significant differences in academic achievement. Further, Russell et al. (2007) compared the academic performance of distance and on campus clinical laboratory science students. Findings were consistent with prior research with no significant differences in academic performances in face to face compared with distant trained students (Freeman, 1995; Olmsted, 2002; Russell et al., 2007). Further, Markova, Roth, and Monsur (2005) conducted a one year study of 36 Wayne State University family medicine residents, where both distant and face to face sessions were conducted. There were no significant differences between the two groups in satisfaction with the program or test scores; however, distant students still preferred traditional classroom training even though they agreed the education was as effective via distance (Markova et al., 2005). These findings are consistent with global findings with no significant difference between CME training delivered online compared with traditional classroom settings.

E-health in Canada

Geographical isolation and poor telecommunication infrastructure are key barriers to provision of the best health education to Canadian rural health workers (Curran et al., 2006). The University of British Columbia established the first rural GP training program in 1982 and there has since been an explosion of similar programs (Krupa & Chan, 2005). In Canada tele-education technologies have also demonstrated to be an important part of addressing isolation of rural and remote health care professionals (Curran, 2006). Retention of rural physicians in Canada is a major priority with growth in rural training programs, especially during 1989-2002, where the ability to offer rural medical education to GPs in training significantly increased (Krupa & Chan, 2005). McKendry, Busing, Dauphinee, Brailovsky, and Boulais (2000) conducted a comparative study of examination results of 1013 family physician graduates between 1994 and 1997, including both urban and rurally trained. There

were no significant differences between the two group's educational outcomes (McKendry et al., 2000). McKendry et al. (2000) stated medical training in a community setting is considered the best method for understanding and meeting that communities health needs. Rurally trained physicians generally practice in rural settings as their training equips them with the experience and toolset to meet the needs of their community (Wilkinson, Laven, Pratt, & Beilby, 2003).

Physicians and nurses encompass the largest group of health professionals in rural and remote areas of Canada (Curran, 2006). Therefore, pilot studies have focused on the use of tele-education technologies for physicians and nurses. Lu, Hakes, Bai, Tolhurst, and Dickinson (2008) conducted a qualitative study using focus group interviews at the University of Calgary, Alberta Canada, investigating the factors affecting the choice in family medicine. This study included 17 second year family medicine residence that ranged in age and gender. The results suggested that reasons for not practising in rural areas included; workload, lifestyle, family, and perceived professional isolation (Lu et al., 2008). Alternatively, reasons for choosing rural practice were to gain a diverse work experience and retention increased with opportunities for CME and professional support (Lu et al., 2008). Another Canadian comparative study focused on the correlation between participant and facilitator participation in online CME (Curran et al., 2005). Data was collected between 2003 and 2004 from the CME registration database and analysed using a Pearson r correlation. Together there were 327 registrars from 25 different programs; however, only 180 registrars were identified as partaking in online discussions. The findings suggested a positive correlation between the number of posts made by the facilitator and the degree of participation by participants (Curran et al., 2005). Curran et al. (2005) suggested future studies research the key factors that foster participation and interaction in online CME. This study looked at a variety of programs; however, it is unclear if the 180 registrars were evenly

spread throughout the 25 programs. Further, online discussion posts are not in real-time or as interactive as other online educational tools. Video conferencing is a real-time interactive method and therefore is easily tailored to participants' immediate feedback (Curran, 2006). Curran (2006) found the flexibility offered by video conferencing for CME of rural and remote medical professionals was a key factor to participation rather than cost effectiveness. Due to the shortage of rural health professionals, retention and recruitment of nurses and physicians is a key priority of e-health in Canada.

E-health in the UK

Studies surrounding the use of e-health in the UK for CME training are focused on recruitment of rural health workers and students perceptions of online learning. There is limited opportunity for rural and remote GP placements in the UK even though rural placements impact health professional's decisions to practice rurally. Therefore in order to recruit rural health workers across the UK training programs need to integrate rural placements. Wolstencroft and Macvicar (2011) piloted a study to assess the practicality of remote placements, including cost and interest of trainees and trainers, and the impact that they would have on the retention of rural GPs. Out of the 42 GP specialist trainees who were invited to participate, nine conveyed interest and a total six underwent placements. Data was collected through qualitative interviews and findings suggested that longer rural placements increased retention for pursuing rural practice, one week placements were not long enough (Wolstencroft & Macvicar, 2011). Wolstencroft and Macvicar (2011) suggest further research should focus on value for money with rural training.

A student's initial experience with using e-health in training as health professionals directly affects their use of e-health in the future. Carroll, Booth, Papaioannou, Sutton and Wong (2009) completed a systematic review of 19 qualitative studies that reported health

professionals experience with e-health in the UK, including discussion boards and emails to online educational courses. The findings indicated the potential for e-health, to break barriers including the cost and geographical isolation for CME, even though it's not the most preferred learning style (Carroll et al., 2009). Student communication was reported as a key theme contributing to the learner's experience of e-health and real life scenarios were the best way to learn. Carroll et al. (2009) noted the importance of different learning styles and suggested tele-education for learners who underperform in traditional classroom settings and thrive with the flexibility offered in online learning.

E-health Australia

The current shortage of GPs in rural Australia has been linked to the poorer health outcomes of the rural population, comparative to their urban counterparts (Campbell et al., 2011). Rural Australia has lower access to health care than urban centres which explains the higher rates of morbidity and mortality experienced rurally (Wearne, Giddings, McLaren, & Gargan, 2010). In 2008 it was estimated that there was an undersupply of approximately 1000 rural GPs (Campbell et al., 2011). Rural GPs generally have a broader scope of practice and therefore require more diverse training. Isolation is a key concern for vocational training for both urban and rural registrars; however, social isolation was predominantly an issue for the rural rotations (Larkins et al., 2004). The current shortage of rural GPs in Australia needs to be addressed with long-term policy initiatives and programs (Alexander & Fraser, 2007). The Australian federal government is advocating for GPs in rural areas to make use of the technology available to help reduce levels of isolation (O'Connor et al, 2000; Richards et al, 1999). Campbell et al. (2011) recommended conducting systematic reviews of online training in Australia with specific recommendations to the sustainability and distribution of Australia's GP workforce. Further, Alexander and Fraser (2007) conducted a cross sectional

study on rural GPs in New South Wales current medical practice satisfaction and number of years they intended on staying in rural practice. The survey contained 21 questions and was sent out to 149 GPs and 66 registrars with a response rate of slightly above and below 50% respectively. Rural GPs who are satisfied with their job remained in rural practice 40% longer than those who were unsatisfied (Alexander & Fraser, 2007). Further, retaining rural registrars relies on tackling the professional and non-professional barriers to ensure satisfaction in rural practice.

Undergraduate and postgraduate training programs need to incorporate key factors that influence recruitment of rural health workers in order to increase the rural health care supply. Wilkinson et al. (2003) carried out a national case control study that investigated the relationship between rural undergraduate and postgraduate training and the choice to work in rural practice in Australia. This study included 2414 GPs from both urban and rural practices. The results suggested two factors that influence GPs' decisions to practice rurally; having undergraduate and postgraduate training rurally and those whose final year of high school was spent in a rural school (Wilkinson et al., 2003). In the early 2000's there was inadequate evidence in Australian literature to suggest that rural undergraduate training increased the probability of future rural practice (Wilkinson et al., 2003). However, over the past decade there has been a large body of work conducted that suggests the likelihood of practicing as a rural GP increases concurrently with the length of time spent in rural placements during training (Wolstencroft & Macvicar, 2011). The Australian Rural Undergraduate Support and Coordination program recognized this notion and therefore ensures all medical students undergo a minimum four week rural placement (Campbell et al., 2011). Elliott, Bromley, Chur-Hansen, and Laurence (2009) conducted a qualitative study of GP registrars from the Adelaide to Outback GP Training Program (AOGP) regarding expectation and experience of both pre and post rural placements. This study consisted of 11 pre-rural placement interviews

and 19 post-rural placements interviews. The general findings suggested more negative expectations are reported pre placement and more positive experiences post placement (Elliott et al., 2009). Any negative experiences post placement were associated with; family separation, workload, and travel (Elliott et al., 2009). Thus, negative expectations of rural placements were generally misguided; however, they were often sufficient enough to deter future rural practice. Further, Margolis et al. (2005) piloted a study that explored the possibility of students completing their third year medical rotations in placements that were significantly isolated compare to their peers. From a class of 226 only three medical students from Queensland University volunteered to take part. Each participant underwent an extremely isolating rural placement. The aim of the study was to assess the impact of isolation in terms of academic achievement. The three participants performed the same academically as the other students, however, they reported feeling significantly more equipped for future rural (Margolis et al., 2005). The low volunteer rate means these results cannot be considered as a true reflection of the entire class, the students that volunteered to participate may have been more equipped to undergo isolating rural placements than the other 223 students. Nevertheless, both studies demonstrated the usefulness of rural placement in undergraduate and postgraduate training for recruiting rural health professionals.

Regional training programs (RTP) are well established in Australia and have the responsibility of providing the right training to the GP workforce; this is especially true for rural RTPs (Campbell et al., 2011). Rural training in undergraduate and postgraduate training is well established, however, methods of training continue to adapt to take advantage of the advancements in telecommunications technology. The use of video conferencing is well established in health care throughout rural Australia (Van Ast & Larson, 2007). White et al. (2001) analysed a South Australian tele-education pilot study that used 46 rural mental health workers. They concluded that tele-communication technologies helped health workers

overcome rural barriers while attracting and retaining other health workers to rural practice (White et al., 2001). Robinson (2002) stated over the 1990's many pilot studies were carried out within Australia to test the effectiveness of video conferencing. By 1996 there were 49 active e-health projects focusing on overcoming medical isolation by video conferencing in Australia. The overall outcomes indicated the effectiveness of video conferencing to overcoming rural and remote access to medical education. Van Ast and Larson (2007) conducted semi structured interviews to evaluate an education program using two hour video conferencing sessions including, six service providers, eight carers, and the session facilitator. The facilitator located in Perth connected with practitioners in rural Victoria via video conferencing. The practitioners preferred the video conferencing sessions compared to face to face sessions as the real-time interactive aspects of video conferencing still fostered supportive relationships between participants and the facilitator while reducing costs (Van Ast & Larson, 2007). However, the lack of support and training in the use of video conferencing were key reasons for the lack of interest of GP's (Robinson, 2002). Robinson (2002) examined eight GP's practicing in rural Victoria. All but one GP had experience using video conferencing, however, only two saw it as a useful tool and continued to use it. The GPs felt the technology was difficult to use and incontinent with the amount of organisation and planning it took to set up. The use of video conferencing for training rural health workers in Australia is well recognised. Video conferencing assists in recruiting and retaining health professionals while reducing geographical and personal isolation barriers.

Geographical isolation was considered to have a significantly negative effect on GP registrars learning, however, active support from facilitators can help reduce feelings of isolation. Tele-education helps reduce geographical isolation by connecting distant learners and facilitators via video conferencing. Wearne (2005) piloted a remote vocational training scheme that studied the relationship between rural GP trainers and their trainees. Eight

trainers were included from five states across Australia including; New South Wales, Northern Territory, Queensland, Victoria, and Western Australia. The study found education support could be communicated at a distance with telephone and email discussions. This study supports the notion that each trainer-trainee relationship is unique and flexibility of tele-education allows for a tailored relationship that best suits the trainee (Wearne, 2005). Thus, active facilitation throughout rural training is an effective method of reducing isolation (Larkins et al., 2004). Further, Wearne et al. (2010) conducted a follow up study to account for the relationship between training location and the current location of all GP registrars involved in the remote vocational training scheme from 1999-2005, 24 respondents were included. Additionally, the researchers examined the aspects of interaction that affect the quality of learning between GP registrars and the course facilitators. Similar to other studies nationally and internationally the participants reported support and social networking as key determinants to the success of the training program (Wearne et al., 2010). Furthermore, Bayley, Magin, Sweatman, and Regan (2011) conducted a qualitative study consisting of semi-structured interviews of 15 GP registrars during a compulsory rural placement. Active facilitation was reported as the most important factor to training positive outcomes while personal and professional isolation had negative outcomes including anxiety and depression (Bayley et al., 2011). The key finding demonstrated that compulsory rural placement can have positive outcomes if actively facilitated, however, isolation is a major issue that needs to be addressed (Bayley et al., 2011). Rural training requires active facilitation in order to reduce geographical barriers associated with rural practice. The use of video conferencing aids facilitation and allows facilitators and learner's to connect and develop relationships that best serves the learners needs in order to succeed. The success of rurally trained health workers increases the supply of rural health workers thus improving the health of rural communities across Australia.

New Zealand

New Zealand is a first world country with similar health needs to the US, Canada, the UK, and Australia. The abundance of literature and research on the achievements and endeavours in e-health in each of the respective countries aids the development of e-health across New Zealand. WHO states that national health policies should be modelled to fit a country's specific health needs (World Health Organization, 2005). Previous e-health success and failures should be considered in the development of new e-health systems with specific reference to a country's health goals. In 2009 the National Health Board (NHB) was established under section 11 of the New Zealand Public Health and Disability Act 2000 and the National Health IT Board was created as a sub-committee (New Zealand Ministry of Health, 2012). The National Health IT Board's role is to provide guidance to all information systems within the health sector. The two key roles are too; review investment decisions and administer Primary Health Care IT grants. Currently the main focus is on improving patient care and safety by 2014 (New Zealand Ministry of Health, 2012). As previous literature has demonstrated, in order to improve health care services, medical professional's skills and training need upgrading. There is substantial evidence worldwide supporting the use of tele-communication technologies in the delivery of CME for rural training GPs. The need for online distance CME is apparent in New Zealand. As tele-education programs develop they need to be monitored and evaluated to ensure effectiveness and worth. There is an ongoing need to recruit rural GPs to serve rural communities. In New Zealand isolated rural GPs are fast overcoming distance barriers to access CME, tele-education programmes running in New Zealand. Participant's perceptions of courses are important to the evolution of e-health.

Rural isolation and distance education in New Zealand

Rural isolation presents a massive barrier to CME in New Zealand, similar to the US, Canada, the UK, and Australia. Currently an estimated 4.4 million people reside in New Zealand, with 85% living in urban regions while the remaining 15% living in rural regions (Kerr & Norris, 2004; World Health Organization, 2009a). New Zealand is approximately similar in land size to Britain's mainland which boasts around sixty million people (Kerr & Norris, 2004). There is a wider geographical distribution of individuals across New Zealand and often they have to travel further to reach urban centres. All main tertiary and higher education providers within New Zealand are situated in major urban areas. Distance acts as a barrier to rurally located individuals seeking higher education. Online distance education has been adopted as a method to overcome distance barriers to learning (Ried & Byers, 2009). Accessibility to the internet is fast becoming a problem of the past with a reported 80 internet users per 100 people (World Health Organization, 2009b). Further, there is an average 110 cellular phones subscription per 100 people (World Health Organization, 2009b). Online distance education is becoming increasingly popular, as it has the ability to connect urban and rural regions and deliver unconstrained CME. New technology, such as video conferencing, makes it possible for people to seek education no matter their location (Cunningham & Stamm, 2005). Tele-education in New Zealand offers rural and remote medical professionals support and opportunities for CME thus improving rural medical services (Kerr & Norris, 2004). The increase accessibility of the Internet and the advancements to telecommunication technologies means medical professional's uptake of tele-education is the only barrier to the development of success to medical tele-education in New Zealand.

E-health in New Zealand

Rural health professionals in New Zealand have long been disadvantaged when it comes to accessing health information and CME (Janes et al., 2005). Urban areas are the customary hosts to medical courses, however, the development of tele-education has allowed for these courses to reach rural regions. Due to busy schedules, rural health professional often do not have the time to travel to urban areas to access education and therefore online learning is the only viable option. Kerr and Norris (2004) surveyed the use of telehealth in New Zealand and reported a rapid growth of telehealth projects from 12 in 2000 to 22 in 2003. Further, McLachlan-Smith and Tracey (2000) investigated the reasons for choosing distance education and the experience of Goodfellow Unit Postgraduate students. All 73 students that were enrolled were sent a survey and 46 replied, making the response rate 67%. Researchers found all students developed unique methods of studying to reduce their isolation, videotaped lectures was the most preferred and using the Internet was the least preferred form of learning (McLachlan-Smith & Tracey, 2000). Due to the vast changes to technology over the past decade the methods of learning online have dramatically changed since the year 2000. The current outlets for online education need to be assessed to ensure they are providing additional benefits to distance education. In 2005 less than 10% of rural GPs used the internet more than twice a week, with accessibility to high speed internet as one of many barriers (Kerr & Norris, 2004). Further, isolation and the perceived lack of social interaction, often associated with online learning, were the major deterrents to online participation. Janes et al. (2005) conducted a similar cross sectional survey of all rural North Island GPs attitudes and barriers to participating in online CME. The questionnaire was sent to 6735 GPs and researchers received 430 replies, a response rate of 59%. Positive characteristics associated with online CME included; flexibility and time savings, cost savings and availability of resources (Janes et al., 2005). The barriers included lack of; access to computer, broadband

internet, finding quality information, time, security, and social interaction (Janes et al., 2005). However, the barriers to adoption of telehealth are reducing. There is an increase in accessibility of broadband over rural towns in New Zealand as well as computers steadily becoming a permanent feature of all health-care workplaces (Janes et al., 2005).

Summary and limitations

There is a shortage of literature of GPs experience with distance CME in New Zealand. Currently, the focus is on patient care for e-health. There is a rapid growth in tele-health projects and accessibility to telecommunication technologies across New Zealand. The few studies that focus on tele-education for CME have predominantly focused on student's reasons for choosing tele-education. Nationally and internationally there is little research on the facilitators and traditional face to face learners' perception and experience with tele-education. This thesis is the first of its kind looking at GPEP-1 registrars and trainers experiencing face to face and video conferencing training. This study aims to investigate the effectiveness of video conferencing training in regards to social networking. The research focuses on rural first year general practice registrars as part of a telehealth pilot study determining whether video conferencing based distance education approach is as effective as face to face training.

Chapter Three

Methodology

Introduction/ choosing a method

Methodology refers to the philosophy of a research approach, which is distinctly different from a method that relates to data collection. However, Dew (2007) states that the two are interrelated as the methods we choose significantly impact our methodologies position. Further, research questions are of great importance when choosing a method for research and should drive the researcher. When research questions guide a study the researcher ensures the study investigates what it intends to (Teucher, 2011). Once one has chosen a method consistency is crucial (Braun & Clarke, 2006). Consistency is essential for both quantitative and qualitative research in conjunction with a well written method that clearly demonstrates the research goals to any reader (Belgrave, Zablotzky, & Guadagno, 2002).

There are two different approaches to consider; deductive and inductive. Deductive is typically a quantitative approach that draws on prior knowledge to formulate a testable hypothesis (Dew, 2007). An inductive approach, on the other hand, is essentially a qualitative approach that focuses on observations to identify patterns in data that help to form tentative hypotheses to generate theories (Dew, 2007). Deductive research requires researchers to engage with literature from the beginning of a study whereas inductive research requires researchers to avoid literature until after the study is completed (Braun & Clarke, 2006). In order to make sense of data without preconceptions and prejudice it is crucial to have well rounded understanding of methodology (Dew, 2007).

Qualitative Research

Qualitative research is predominately an inductive approach to research that aims to explain human phenomenon's by collecting in-depth data, usually through interviews, and analysing the raw data sets to determine themes. By the early 1970's non-quantitative research methods were beginning to emerge as separate research methods under the umbrella of qualitative research (Padgett, 2011). There was an upsurge in the use of qualitative research (Gubrium, Holstein, Marvasti, & McKinney, 2012). The main reason for conducting qualitative research is to capture knowledge, concerning a certain topic, from the internal point of view (Padgett, 2011). Qualitative research does not aim to quantify instead it seeks to analyse and describe a social phenomenon (Pope, Ziebland, & Mays, 2000). Qualitative research at its core aims to humanise the problem or issue through an acquired rich or thick description obtained via a person-centred means. Creswell (2012) supported this claim by stressing the importance of the participant involvement. While quantitative research works best when control of the environment is required the reverse is true for qualitative research. Flexibility is a major advantage of qualitative research. Fluid guidelines provided by qualitative work permits researchers to gather results through the use of a method best tailored to their needs (Padgett, 2011). However, the two main reported downfalls of qualitative research are data collection and analysis (Easton, McComish, & Greenberg, 2000). This highlights the important role of the qualitative researcher. The role of the researcher is immensely different in quantitative and qualitative research (Dew, 2007). This difference is predominantly observed in the reporting style of qualitative research as it takes a narrative, more reader friendly approach (Padgett, 2011).

When conducting research of any kind it is important that all limitations of the chosen methodology are apparent to the researcher and addressed accordingly. All research methodologies contain restrictions preventing them from investigating certain research

questions. Quantitative methods demonstrate weakness when the research concerns an in depth study into a variable phenomenon (Padgett, 2011). Quantitative research predominantly works from a deductive approach which employs prior understanding on a particular topic to support development of a testable hypothesis (Dew, 2007). The opposing approach, inductive qualitative research, disregards prior knowledge and instead focuses on obtaining knowledge concerning the social world through raw data (Dew, 2007). Dew (2007) explains there is no right way of going about qualitative research only more suitable approaches for certain a research topic. Qualitative research provides a thick and rich description of raw data (Cooke, Smith, & Booth, 2012). Nevertheless, qualitative research comprises a number of methods (Creswell, 2012).

Qualitative health research

Qualitative research is a relatively new concept in the realm of health. Three leading qualitative methodologies are; grounded theory, ethnography, and phenomenology (Hunt, 2009). A random controlled trial (RCT), a quantitative research method, has long been seen as the golden standard for health care intervention research (Lee, 2006). While quantitative data analysis is grounded in a strong research tradition, qualitative data is often described as the poor cousin in health and social science research (Neergaard, Olesen, Andersen, & Sondergaard, 2009). The inability of quantitative and qualitative researchers to communicate with each other severely hindered the growth of well rounded health research (Belgrave et al., 2002). Nevertheless, qualitative research has gathered a large following over the past 60 years (Morse, 2012). By the mid 1990's the demand for qualitative health research exploded (Attride-Stirling, 2001; Morse, 2012). There is a growing understanding in health research that inductive qualitative research provides the best understanding of the subjective health experience (Belgrave et al., 2002). Quantitative research has old roots and therefore is often

the preferred method; however, qualitative research has the ability to generate thick descriptive data beyond the capability of quantitative research.

Human understanding about health science phenomena is deepened due to the growth in qualitative health research (Belgrave et al., 2002). The ability for anybody to read qualitative health research is often viewed as a weakness. The simple everyday language style of writing of qualitative research is viewed in quantitative standards as weak. However, the simplification of qualitative work does not signify its failure to capture the complex social world but rather demonstrates its ability to convey a complex phenomenon in a comprehensible manner (Sandelowski & Leeman, 2012). Morse (2012) suggests that another major criticism of qualitative health research is that it is most likely invalid. A study is weak and invalid when it neglects to answer the research purpose. How the analysis was carried out it is often omitted and what and why are given precedence (Attride-Stirling, 2001; Braun & Clarke, 2006). Method and data analysis chapters are crucial to a study as they set the foundation (Easton et al., 2000). In order to provide valid research a researcher must clearly outline how results were determined. Comprehensive summaries of studies need to be achieved in order for qualitative research to evolve (Attride-Stirling, 2001).

The time and a place for qualitative health research is when research focuses on the social world (Dew, 2007). Qualitative health researchers use an inductive approach centred from the participants' perspective rather than the researcher, in order to explore issues or a phenomenon (Morse, 2012). As stated earlier the research question should drive the method and the growing amount of health research questions call for qualitative analysis.

Finding a fit

When it comes to qualitative research there is no universal method but rather a qualitative method that best fits the research purpose (Padgett, 2011). Qualitative research

focuses on the social world therefore methods capturing data need to reflect this. Gubrium et al. (2012) emphasises the social aspect of the interviewing process. Interviews allow for the subject to drive the themes as the word itself suggests an ‘inter-view’ of the subject’s lived experience with a certain phenomenon (Gubrium et al., 2012; Young, 2011). Research and data analysis should always link directly to the purpose of the study. This is particularly necessary for qualitative studies where the overwhelming amount of data can easily submerge the researcher’s intent (Krueger, 1988). Krueger (1988) claimed undertaking qualitative data analysis is comparable to the entrance of a maze. In order to find the entrance that provides the clearest pathway for conducting research, the first step involves selecting the methodological approach that best fits your purpose.

Due to the complexity and diverseness within qualitative approaches, Braun and Clarke (2006) highlight the importance of learning the fundamental basics, thematic analysis. Thematic analysis offers researchers core skills needed to carry out any qualitative research. Thematic analysis promotes flexibility through its theoretical freedom. The thematic analysis framework offers the potential for rich, thick data collection. Though flexibility can be abused therefore it’s essential that researchers tread carefully and follow a sound methodology. Braun and Clarke (2006) argued that thematic analysis is a qualitative method in its own right. Braun and Clarke (2006) offered a guideline for researchers embarking on thematic analysis. A key element in any qualitative research is formulating themes. Having a clear definition of themes is critical; however, qualitative researchers are yet to agree on a universal definition (Sandelowski & Leeman, 2012). Language is therefore essential in communicating meaning and experience (Braun & Clarke, 2006). In order to gain knowledge and improve, qualitative research needs to be systematically documented (Miles & Huberman, 1994).

Focus group interviews

Qualitative research data collection methods include but are not limited to; one-on-one interviews, focus group interviews and questionnaires. These methods of collecting data are favoured as they collect data from the participant's point of view or preference (Carroll et al., 2012). There are many different types of interviews and each one has unique strengths. Berg (2001, p. 99) outlines ten commandments to follow when conducting any interview;

1. Never begin an interview cold.
2. Remember your purpose.
3. Present a natural front.
4. Demonstrate aware hearing.
5. Think about appearance.
6. Interview in a comfortable place.
7. Don't be satisfied with monosyllabic answers.
8. Be respectful.
9. Practice, practice, and practice some more.
10. Be cordial and appreciative.

The importance of following this or similar commandments when interviewing cannot be stressed enough as it sets the tone for the entire interview. The interview tone can greatly impact the data both negatively and/or positively. The interview specifics should be tailored to different situations and circumstances in order provide quality data. The location of the interview is also important as it sets the tone for the interview. Participants should feel

relaxed and comfortable in order for the interview to go smoothly (Gubrium et al., 2012). The researcher should keep this in mind when selecting a place to hold the interview. Ultimately, the strength of an interview relies on the researcher's ability to conduct the interview process (McLafferty, 2004).

Focus group interviews have demonstrated strength through their ability to gather information concerning attitudes and perceptions of the participants (Krueger, 1988). Focus group interviews consist of a group of individuals united together with a purpose to listen and discuss information relating to a pre-determined phenomenon. Participants are selected due to characteristics they have in common. Put simply, participants should be selected due to their ability to provide the best information on the phenomenon being investigated (Liamputtong, 2009). The number of individuals required for a focus group varies although it is suggested between four and twelve is a suitable number (Krueger & Casey, 2000). The number of participants involved in a focus group interview is not as imperative as each individual member's participation during the interview. There is no fixed time frame for focus group interviews, focus groups should run until information saturation is acquired. Saturation is a term used in focus group interviews that refers to the point where no new information is left (Krueger & Casey, 2000). In order to achieve saturation a focus group requires; a valid method for data collection, open interaction among participants, and an active researcher guiding the discussion (McLafferty, 2004).

There is an ongoing debate of the relative merits of individual interview verses group interview approaches. One-on-one interviews offer a more in depth view on a particular individual perspective whereas focus group interviews offer a rich group perspective (Liamputtong, 2009). Focus group interviews extend further as they encourage participants to feed off each other's thoughts and share their own perspectives. Focus group interviews are

reliant on the group dynamic with dramatic changes in group dynamics comes dramatic changes in data collected (Liamputtong, 2009). The information provided will differ depending on the interview situation (Dew, 2007). A homogeneous focus group allows individuals with a shared experience to discuss with more ease and freedom. Whereas a poorly formulated focus group could hinder research findings as participants may not feel comfortable sharing their true thoughts. Focus groups need to provide a safe place where participants feel comfortable sharing their perspective. There is much debate surrounding the ideal qualities of a focus group, however, the best focus group interview allows participants to guide the interview and share their perspectives openly until all ideas are covered.

Importance of data analysis

Once methodology is sorted and data collection is carried out (closely following the method design), data analysis becomes the next major task for qualitative researchers. For qualitative health research, data analysis is often an overwhelming task due to the immense amount of raw data collected, typically transcripts from focus group interviews (Krueger & Casey, 2000). Transforming the raw transcripts into thematic statements is the main goal in qualitative health research (Sandelowski & Leeman, 2012). However, there is a lack of useful tools to facilitate this labour intensive task (Attride-Stirling, 2001). Unlike quantitative research, little importance is often placed on the research findings and presentation of qualitative research (Sandelowski & Leeman, 2012). This justifies some academics perceptions of qualitative research as weak and poorly presented research. Again the research purpose should drive the analysis; the depth of analysis should mirror the depth of the research purpose (Krueger & Casey, 2000).

The first step to data analysis requires looking back to the purpose of the study (Krueger, 1988). The purpose of the study should be included throughout the whole research

process as it provides a clear guideline for data analysis (Krueger, 1988). Data collection and analysis call for a clearly outlined plan, similar to methodology and method, regardless of the analysis approach (Thorne, 2008). Too often researchers skim on information deemed irrelevant when altogether the small bites of information provide readers with a well rounded view of how data was handled. It is extremely difficult to evaluate research without a transparent understanding of how that data was analysed (Braun & Clarke, 2006). Data analysis should be relevant and assist the research purpose, for example if a thick and rich description of a phenomenon is required then researchers should employ thematic analysis (Braun & Clarke, 2006). Following a clearly mapped plan is crucial in order to avoid selective perception, where results are formulated through pre-existing researcher biases (Krueger, 1988; Krueger & Casey, 2000).

Thematic analysis

Once the data collection is completed the researcher is posed with the task of making sense of the raw data. Thematic analysis dates back to the 1950s and has since been a widely used method of encoding qualitative data (Howitt, 2012). The simplification and flexibility of thematic analysis allows researchers to present findings with clarity to a diverse audience. Thematic analysis is a process of encoding raw qualitative data (Fereday & Muir-Cochrane, 2008). In contrast to grounded theory, thematic analysis is driven by the data as a descriptive method rather than building a theory from the ground up (Howitt, 2012; Liamputtong, 2009). Fereday and Muir-Cochrane (2008) demonstrated the use of thematic analysis with a hybrid approach using both data driven (inductive) methods and theory outlined (deductive) approach. Boyatzis (1998) stated thematic analysis is a method used to support researchers but not as a separate method of research, such as grounded theory. However, Braun and Clarke (2006) argued thematic analysis as a methodology on its own rather than a method of

data analysis. Thematic analysis is not exclusive to one theoretical framework and therefore has the adaptability to work within a wide variety of qualitative methods (Braun & Clarke, 2006). Thematic analysis essentially serves as a flexible method for sorting raw data into themes that define a phenomenon (Braun & Clarke, 2006; Fereday & Muir-Cochrane, 2008; Liamputtong, 2009). Thematic analysis is an inductive research approach best suited to analysing raw data.

Currently, there is no agreed upon method amongst qualitative researchers for conducting thematic analysis. Liamputtong (2009) outlined the two key components of thematic analysis; thoroughly read through each transcript to make sense of the data and making sense of what the data means as a whole. Further, Boyatzis (1998) outlined the three key steps to thematic analysis; collecting data on a particular phenomena and presenting it in written form, identifying themes and patterns within the data, and lastly interpretation of these themes. Further, Aronson (1994) outlined four steps involved in thematic analysis; data collection, identifying data, sorting data into related themes, and validating themes used through related literature. By definition thematic analysis is simply an analysis of major themes within raw qualitative data (Howitt, 2012). The key objective of thematic analysis is to identify themes that capture and describe a phenomenon in an unbiased manner (Aronson, 1994; Fereday & Muir-Cochrane, 2008). Thematic analysis acts like a translator, for qualitative researchers, bridging the gap between qualitative and quantitative research (Boyatzis, 1998).

Thematic analysis can be extremely time consuming and requires a lot of attention to detail. Once all data is transformed into written text the task begins with coding. Thorne (2008) compares coding to sorting laundry; initially you gather all the dirty laundry into one basket and then proceed to separate into colours. Once the colours are separated they need to

be cross-examined to determine their relationship within each theme/colour and between the different themes/colours. Consistency is the key aspect required when analysing the data for themes. A six step guide to conducting thematic analysis was developed to help assist researchers in the journey of thematic analysis (Attride-Stirling, 2001; Braun & Clarke, 2006). The six steps comprise of; transcribing and reading through raw data, creating preliminary codes, clustering codes into prospective themes, checking validity within each themes and relations between themes, clearly defining each theme, and reporting the analysis (Braun & Clarke, 2006). When analysing the data it is important the researcher stays focused on the study purpose (Krueger & Casey, 2000).

The researcher is the key element to good qualitative analysis (Pope et al., 2000). Qualitative analysis is a time consuming and labour intensive task when conducted correctly. The belief that qualitative research is quick and easy is unfounded as valid qualitative research requires a researcher with; expertise, vision, and reliability (Pope et al., 2000). The role of the researcher is vital when conducting thematic analysis as well as the write up and wording (McLafferty, 2004). Humans are not capable of processing large amounts of complex information therefore our predisposition is to break down the information into categories (Miles & Huberman, 1994). Thematic analysis is therefore a method humans are predisposed to perform, although, careful consideration by the researcher is needed to ensure initial biases are avoided. Sadelowski and Leeman (2012) outline the importance of writing thematic sentences in qualitative health research. The simplification of qualitative findings should not discredit the active role researchers undertake during data analysis. Researchers must ensure that they accurately report the active role taken when formulating themes. Words such as ‘emerging’ or ‘discovered’ imply the role of the researcher as passive (Braun & Clarke, 2006; Howitt, 2012). This misinterpretation denies the active role researchers undertake in indentifying themes. On the other hand, using interview questions as themes

demonstrates the researcher's inability to carry out inductive research (Braun & Clarke, 2006). The method of writing thematic statements is an art form in itself and when well written thematic statements have the capability of summarising a complex phenomenon in everyday language.

In all research there are certain downsides that need to be addressed. Understanding and demonstrating the analysis purpose is crucial in assisting researchers in overcoming these limitations. Braun and Clarke (2006) list five pitfalls to thematic analysis; poor analysis of the data, the use of interview questions as reported themes, weak analysis where themes show overlaps without clarity and consistency, disparity in meaning between the themes and the raw data, and lastly inconsistency between the research purpose and the method of analysis used. In order to prevent these potential pitfalls researchers need to be aware and actively avoid making these mistakes. A rich description of the raw data is the desired outcome and therefore researchers need to provide a rich analysis of the data. Braun and Clarke (2006) have outlined a six step guideline to ensure researchers obtain valid and reliable results. A major strength of thematic analysis is its flexibility to present findings that are readily understood to the general public. Thematic analysis is a qualitative approach suited to applied research as a rigorous and systematic method (Guest, MacQueen, MacQueen, & Namey, 2011). Qualitative researchers have a vast amount of freedom when choosing thematic analysis as their method. Thematic analysis works as an inductive method and therefore is not committed to developing a theory. Researchers conducting thematic analysis are unlimited in their approach, while considered an advantage; it can also serve as a disadvantage. Thematic analysis requires researchers to explicitly describe their approach in detail; if their theoretical approach is left unaddressed readers are left to interpret the results without knowledge of how the results were obtained. Inductive research is fundamentally flexible however within this flexibility it relies on interpretation. There is a certain amount of bias that comes with

interpretation from the researcher as well as the reader. However, following a reliable analytic approach the researcher is able to provide a transparent account of the data analysis subsequently providing a clear understanding of how the results were achieved (Belgrave et al., 2002). Thematic analysis defining attribute is its flexibility, the method for formulating themes is not as of great importance as consistency in choosing them (Braun & Clarke, 2006).

A step-by-step guide is a useful tool to data analysis to ensure unbiased results. Braun and Clarke (2006) stressed the role of steps to thematic analysis as guidelines and not rules. The analysis of data can begin as early as the data collection phase as familiarity with the data is a fundamental component. Phase one is often involved with simple tasks such as taking notes on potential themes and ideas. The physical act of writing should begin from this stage. Transcribing data into written form is arguably seen as the best method for researchers to familiarise themselves with the data (Braun & Clarke, 2006). The accuracy of transcripts is essential as simple punctuation can dramatically change meaning (Easton et al., 2000). Once you have familiarised yourself with the data the next step involves creating preliminary codes (Braun & Clarke, 2006). Preliminary codes are developed through a process of reading the transcripts and coding the different passages. It is important to code as much text as possible as being extremely selective in the early stages makes it impossible to move forth with further stages (Thorne, 2008). Codes will vary depending on methodology; however, the key to success at this stage is simple, to code with as much freedom as possible. Further, the codes need to accurately reflect the data set in its entirety (Braun & Clarke, 2006). Once the transcripts have been successfully coded the next phase entails making sense of the different codes and correlating them into overarching themes. The idea is to include all the codes as some codes may go on to become themes. Braun and Clarke (2006) state it is acceptable to group themes that don't fit under central themes as miscellaneous. Subsequently the themes

need to be refined; all codes within a theme should positively correlate with one another and all themes should be distinctly different for one another (Braun & Clarke, 2006). Transcripts should be looked back over during this stage to ensure; themes work in relation to the data set and to ensure all codes are included. Themes need to be thoroughly refined and defined further in preparation for the final analysis. It is important to identify whether key themes incorporate any sub-themes. Further, the process of naming each theme is a challenge and needs to be well executed correctly in order to accurately represent what the theme is about. Once the researcher arrives at this stage all that's left is the final step of writing up the report. This step is crucial as it communicates to the reader about the data and bears the capability to validate research. Strong extracts from the raw data help to reinforce intention while arguing the research purpose (Braun & Clarke, 2006). Themes need to accurately represent the raw data and measure the intended research purpose.

Method

Research purpose

As mentioned in the previous chapter, a significant proportion of General Practitioners (GPs) live rurally in New Zealand. Geographical isolation creates a barrier for medical professionals seeking continued medical education (CME). Initiating programs to run CME for rural GPs is a growing area of telehealth (Kerr & Norris, 2004). Despite the growing interest in telehealth there is a gap of knowledge regarding the use of telehealth for CME of GP registrars practising from rural and remote locations in New Zealand.

The purpose of this research is to investigate the videoconference training approach used by rural GP registrars. Further, this research seeks to investigate the advantages/disadvantages, from the perspectives of the registrars and facilitators, of the telehealth training approach in terms of social interaction.

Research questions

1. Does videoconference distance based training offer equivalent or improved clinical and educational experiences, compared with traditional face to face training, for GP

Registrars in the General Practice Education Programme (GPEP-1 training programme)?

2. In terms of social bonding what are the advantages and disadvantages for GP

Registrars using telehealth compared with face to face training?

Specific aims

- To examine whether the telehealth training approach for general practice registrars is as effective, in terms of their clinical and educational learning experience, as traditional face to face training.

- To examine the effects of the telehealth training approach in terms of social networking.

Research proposal

The University of Canterbury School of Health Science was contacted by the medical educator of a stage one General Practice Education Program (GPEP-1), regarding a pilot teleconferencing program that was being trialled. The GPEP-1 consisted of three onsite registrars (based in the same city as the training facility) and three offsite registrars (based in a neighbouring town approximately 114 kilometres away). The aim was to evaluate the telehealth pilot program using a qualitative research approach.

A proposal was developed and refined with the help of my supervisors as well as feedback from the medical educator. A finalised proposal was submitted and approved by the University of Canterbury's Associate Dean of Postgraduate studies on the 23rd of November 2012. Further, an application for low risk ethical approval was reviewed and approved by the

Chair of the University of Canterbury Human Ethics Committee, on 14th of November 2012
(Reference: HEC 2012/91/LR).

Ethical considerations

Participant confidentiality: Only my supervisors and I have access to the raw data including; the audio recordings of the interviews and the transcripts. All raw data is stored in either a locked filing cabinet or in password protected electronic file. Information sheets were provided to each participant, two versions; one for the registrars and one for the trainers, detailing a brief overview of the study and what would be required of them if they agreed to participate (see Appendix A). Consent forms were also provided to each participant; two versions; one for registrars and one for the facilitators, to sign if they agree to part take in the study (see Appendix B).

Raw Data: Once the audio files were transcribed each participant had the opportunity to read over and add, alter, or delete any information they provided.

Study Design: Qualitative health research: thematic analysis

Three post-training focus group interviews were held; one for the onsite registrars, one for the offsite registrars, and one for the facilitators. Each interview was digitally recorded and audio recordings were then transcribed by the researcher. The transcript text was used as the raw data for this study. The raw data was analysed using Braun and Clarke's (2006) guideline for thematic analysis.

Pilot training programme

The General Practice Education Programme (GPEP) main educational goal is to transition registrars from a hospital based to the community-based model of health care. The programme focuses on registrars working in either rural or urban general practice settings.

The standard full-time GPEP training is, 36 months, separated into two stages; GPEP1 and GPEP2. In New Zealand First Year General Practice (GPEP-1) registrars are put through an intense 10 month training programme where they see patients and receive one on one teaching from qualified educators. Each registrar is also required to attend day release seminars once a week in small groups. However, the flexibility of telehealth allows for the seminars to be carried out via distance in real-time and allows for interaction similar to face to face (Wootton, 2001).

This study focused on the Wednesday seminar release training of the GP registrars. This study focused on two regions within New Zealand that together form one District Health Board (DHB). Due to the small size of the two regions there is only one training program for both. The largest township within the two regions plays host to the training program, this will be referred to as the onsite training facility. The offsite training facility is located in the largest township of the second region. Study participants included six registrars and three facilitators; three onsite based registrars, three offsite based registrars, two onsite based facilitators and one offsite based facilitator. The seminars commenced on the 22nd of February, 2012 and ran till the 5th of December, 2012. There was 37 seminar days in total. For the first three months of the year, until the middle of May, all six registrars received face to face seminars at the onsite training facility. For the remaining seven months the offsite based registrars used a videoconferencing unit located in their local hospital to link in to the weekly seminars. There were a few exceptions where the offsite registrars travelled onsite to the seminars to maintain the group culture. There was one seminar when the onsite registrars and one onsite facilitator travelled to the offsite town. The onsite registrars attended a full year of face to face seminars while offsite registrars videoconferenced for the last seven months of the year.

Participants

Recruitment

Due to the nature of the study recruitment was not an issue. In order to get an accurate retrospective account of the pilot program everybody involved was recruited. This included; three onsite registrars, three offsite registrars, and three facilitators. In order to build rapport with the registrars and facilitators involved in the pilot I travelled to one of the Wednesday seminars. I provided a lunch, introduced myself, and the purpose of my study. The purpose of this exercise was to provide the registrars and facilitators with an understanding of my study and what would be required of them if they consented to take part. One of the onsite registrars and one of the onsite facilitators were not in attendance. However, contact was made with both individuals through email prior to their respective focus group interviews. Further, a telephone conversation during a following Wednesday seminar was made to arrange; times, dates, and locations for the focus group interviews. Each participant was sent a copy of an information sheet and list of the semi-structured questions prior to the interviews to look over. Consent was obtained from each participant before their respective focus group interviews.

Participants

Overall this study included nine participants, these participants are categorised into three separate groups.

Group one: Onsite registrars. This group consisted of three GPEP-1 registrars' who were geographically located in the same city as the training program. All three onsite registrars were females and experienced a full year of face to face training.

Group two: Offsite registrars. This group consisted of three GPEP-1 registrars' who were geographically located in a town approximately 114km distance for the training city. All

three registrars were females and experienced a mixture of face to face and teleconferencing training.

Group three: Facilitators. This group consisted of three male GPs. The first facilitator was the GPEP-1 medical educator, who oversaw the training program and was not directly involved with the weekly Wednesday seminars. The second facilitator was the onsite facilitator, who was geographically located in the training city. The onsite facilitator led all the face to face training for the onsite registrars as well as the face to face training for the offsite registrars when they travelled. Further, the onsite facilitator conducted all the teleconferenced training. The third facilitator was an offsite facilitator who became involved with the program when the offsite registrars switched to teleconferencing. The third facilitator was geographically located in the same offsite town as the offsite registrars. The offsite facilitator worked on the Wednesday morning and joined the offsite registrars after lunch when they switched from teleconferencing to face to face training with him.

Qualitative data

Three post-training semi-structured focus group interviews were held to gather qualitative data. The researcher recorded all three interviews using an audio recording device (on loan from the University of Canterbury) and a voice memo program on the iPhone 4s (the researcher's personal device) as a backup device. The researcher listened to all three recordings and transcribed them to create the raw data set.

Settings: Focus groups interviews

1. The first focus group interview included the three onsite registrars. The interview took place in the same onsite room where the weekly Wednesday seminars were held. The room was a very formal setting, well lit (all unnatural light), comfortable and familiar to the registrars. The room was also very private. All three registrars were at the

location prior to the interview and were already seated when the researcher and supervisor entered.

2. The second focus group interview included the three offsite registrars. The interview took place at café/bar located in the offsite town. The café was chosen as it was a neutral place with a relaxed atmosphere. The researcher and supervisor arrived first and set up in the quietest corner. Due to a wedding party the conference room was booked. One by one the registrars filed in first coming over to put their stuff down and then heading to the counter to order refreshment. The room was well lit (with natural light), comfortable, however, it was not overly private. Further, there was a constant buzzing of conversation, eating, and the coffee grinder.

3. The third focus group interview included the three facilitators. The interview took place at the hospital in the offsite town. My supervisor, the offsite facilitator and I were all physically present and the two other facilitators telephoned in together from the onsite training centre. The hospital room was well lit (with both natural and unnatural light), formal and very private.

Instruments and measures

Two separate semi-structured guides were used in order to help with the direction of the interviews.

The first guide was used during the two focus group interviews with the registrars. This guide consisted of 25 questions, with a range of open and closed questions (see Appendix C). The list of questions was used purely as a guide for the interviewer. Additional questions were asked in relation to the registrar's responses.

The second guide was used during the facilitator's focus group interview. The guide consisted of 15 questions, also with a range of open and close questions (see Appendix D). Further, this was also used as a guide to assist the interviewer. These questions were used as guides and were adapted where the researcher saw fit.

Equipment

Two recording devices were used to record the interviews, one on loan from the University of Canterbury with an external microphone and my own personal phone as a backup recording.

Procedure

Initial contact was made by the medical educator of the program to organise a meet and greet with the registrars and trainers. I meet up with the group on the 31st of October 2012, the one Wednesday session when the group meet at the offsite PHO. Five registrars were in attendance, one onsite registrar was away, and the two facilitators were in attendance, the medical educator was not present. The meeting started promptly at 1pm, I gave a brief introduction of the study and the aim which led to a discussion on the teleconferencing aspect of their training. Availability for the focus group interviews was discussed and confirmed a week later via a telephone call.

Ethical approval was yet to be obtained and became the number one priority. Ethics was submitted as urgent and approved on the 14/11/2012.

It was noted earlier that the ideal number for a focus group interview is between 4-12 participants; however, due to the small scale of the pilot study the maximum number of participants was achieved. The original plan was to incorporate only two focus groups with the registrars. However, after careful consideration a third focus group, the facilitators, was

added to ensure the study included all individuals involved in the pilot program to capture a well rounded account.

The first focus group interview was held on the 28th of November 2012 in the onsite city with the onsite registrars. The room used for the interview was the same used for the onsite training. The interview took place at 2pm with the registrars already in the room when my supervisor, Associate Professor Ray Kirk, and I arrived. My supervisor and I signed into the building and were directed to the conference room. The onsite facilitator was also in the room and informed us that we had one hour to hold the focus group, as a guest speaker was arriving at three. The facilitator left the room and introductions were made and my supervisor and I proceeded to hand out the information sheets and consent forms. All three registrars signed the consent form, under the condition that they would not have to fill in the carbon foot print calculator. The registrars were made aware of the fact that we were recording the interview in order for me to transcribe the interview. The registrars were informed that they would have the opportunity to view, alter or change anything they said once transcribed. Each registrar was given a copy of the interview question guide so they could follow it as they wished. The interview then began with the first question on the guide sheet. Due to the nature of their involvement with teleconferencing, being that they received face to face training, many of the questions were adapted to suit their experience and feedback. The interview was interrupted by the guest speaker arriving half an hour early. The guest speaker remained in the room for the rest of the interview. The interview lasted approximately fifty minutes. Once the interview finished I took some notes of my impression of the interview and themes I could identify. Next I transcribed the interview, I used iTunes to play the audio and Microsoft word processor to write. Once I finished transcribing I went over the transcript along with the audio file to ensure accuracy. I began taking notes of possible codes during transcribing and highlighting strong extracts to help with the later analysis.

The last two focus group interviews both took place in the offsite town on the 13th of December 2012. The offsite registrar focus group was first at 10:30am at a café/bar in the CBD. My supervisor, Dr Arindam Basu (Arin), and I arrived first to the café in order to set up a table before the registrars arrived. The function room was booked so we had to find the quietest table in the establishment to hold the focus group. The registrars arrived separately; each registrar was greeted by Arin and myself and then proceeded to order a drink. Once they had settled at the table I handed them an information sheet and consent form to read over and sign. All three registrars sign the consent forms. Due to the delayed arrival of the third registrar, and the café worker informing us that the lunch rush was about to begin and it would get a lot louder, the interview commenced with just two of the registrar. The third registrar joined once she arrived. The interview followed the guide questions more closely than the previous focus group, as this group experienced teleconferencing first hand. The interview lasted approximately one hour and twenty minutes. The registrars were informed they would have access to the transcripts to view, alter or change anything they had said.

The third focus group interview took place at the offsite town's hospital with the three facilitators. The offsite facilitator met Dr Arindam Basu and I in a room that had been pre booked for our meeting. The original room chosen was one with a teleconference unit; however, after repeated tries to get it working we had to move location, which the offsite facilitator insisted, never occurred during the teleconferencing sessions. The location of the interview was moved due to time constraints of the facilitators teleconferencing. A speaker telephone was used to call the onsite facilitators, who were together in the onsite trainer room. The onsite facilitators were sent a copy of the information sheet and consent form and the offsite facilitator was given a copy of both prior to the telephone call. The interview followed the facilitator's guide questions with each facilitator taking turns to answer the questions. Due to the circumstances of the interview it proved much harder to have a semi-

structured interview, however, it was achievable. During the interview I received a call to my phone which stopped the voice memo recording. However, the other recording device, on loan from the University, captured the entire interview. The interview lasted approximately thirty minutes. The facilitators were informed they would have access to the transcripts to view, alter or change information they had given. Again I noted down ideas of potential themes and impressions for both of these interviews. Both audio files were then transcript, again using iTunes and Microsoft word processor. I went over both audio files twice in order to check them against the transcripts to ensure accuracy.

Data analysis

Once all the audio files were transcribed into word documents I proceeded to analysis the data. All three transcripts were kept completely separate through the duration of the analysis. However, all three transcripts underwent the same process. To analysed the data I followed Braun and Clarke (2006, p. 87) six step guideline to thematic analysis; “familiarizing yourself with your data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report”. The data were condensed into main and subthemes to be presented in the results. An overarching theme or concept that summarised a major topic within the raw data was defined as a main theme. The subthemes were defined as branches off the main theme. Subthemes were not big enough to encapsulate a topic but with a collection of related subthemes together they comprised the components of a main theme.

Step one; familiarizing myself with the data, began when I was transcribing the audio files. I listened to each audio file twice to ensure accuracy of the transcripts and then read through the transcripts once more to familiarize myself with the content.

Step two; generating initial codes, began when I was in the initial stages of transcribing. I made note of possible codes and themes for future review and reference. I recorded any possible codes and themes not matter the size. I began to re-read through each respective transcript and code, in the margin, any and all possible codes. There was no limit to the amount of codes one passage could cover. To make the process easy to follow I numbered off each line of the transcript and with each code I recorded the line numbers and code on a separate word document. The number of codes varied between the groups; offsite registrar's transcript had 196 codes, onsite registrar's transcript had 128 codes and the facilitator's transcript had 75 codes.

Step three; searching for themes, I then proceeded to group all similar codes into groups. The groups that I formulated became known as subthemes. Each focus group had a different number of subthemes; offsite registrars had thirty, onsite registrars had twenty eight, and the facilitators had twenty five. These subthemes were analysed further to determine similarity and differences. The similar subthemes were grouped together to compile main themes, there were eight main themes for the offsite registrars and seven for both the onsite registrars and facilitators.

Step four; reviewing themes, I went over the transcripts and codes to ensure the main themes and subthemes represented the data set as a whole. I started to map how each subtheme related and worked together to summarise the raw data set.

Step five, defining and naming themes, the main themes renamed and defined. I went through each subtheme and copied the extracts from the original data set that related to these themes. I analysed to make sure there were no over laps and that there was sufficient evidence of each subtheme. I selected the best extracts to describe the subtheme and wrote a short definition of each subtheme. During this process some main themes and sub themes

were dropped due to lack of evidence or irrelevance. Further, at the end of this process; the offsite registrars had seven main themes and twenty eight subthemes, the onsite registrars had seven main themes and twenty subthemes, and the trainers had four main themes and eleven subthemes.

Step six, producing the report; finally the main themes and sub-themes were sorted into level of importance, with the most important at the start. The main themes were rated on how well they represented the raw data set; the themes that more accurately represented the data were listed as more significant. See chapter four the result for a full copy of the report.

Chapter Four

Results

Introduction

All six of the registrars and three facilitators involved in the 2012 pilot tele-conference GPEP-1 training program participated in this study. The nine participants were split into three separate groups; offsite registrars, onsite registrars, and the facilitators. The offsite registrars consisted of the three GPEP-1 registrars who were geographically located in a town offsite from the seminar host town. The onsite registrar group consisted of the three GPEP-1 registrars who were geographically located in the same/onsite town where the seminars were held. The facilitator group consisted of the; course coordinator, the onsite facilitator (who was geographically located in the same town as the onsite registrars), and the offsite facilitator (who was geographically located in the same town as the offsite registrars). All nine participants took part in a one of three focus group interviews in their respective groups. All three focus group interviews were digital audio recorded and transcribed. Data analysis followed a six step process; familiarisation with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report (Braun & Clarke, 2006, p. 87).

Analysis of the offsite registrar data established seven main themes and twenty eight subthemes. Analysis of the onsite registrar data established seven main themes and twenty subthemes. Analysis of the facilitator data established four main themes, which were also found in the other two groups, and eleven subthemes. See Table one below for an overview of the main themes and subthemes that related to each respective group.

Table 1: Main Themes and Subthemes of the Three Focus Groups

Key Themes	Group		
	Offsite Registrars	Onsite Registrars	Facilitators
	Sub Themes		
Group Culture	Bonding Dynamic/ Identity Size Maintaining	Bonding Dynamic/ Identity Size	Bonding Dynamic/ Identity
Facilitation	Active Facilitation Teleconferencing – Differences	Active Facilitation Teleconferencing- Differences	Active Facilitation Experience- Teleconferencing
Teleconferenced Education	Communication Room Guest Speakers Role Plays Disadvantages Establishing- Teleconferencing Future- Teleconferencing	Communication Room Role Plays Disadvantages Baseline	Communication Guest Speakers Future- Teleconferencing
Technology	Adjusting Flexibility Lag Time Confidentiality Emotional Distant	Adjusting Flexibility Lag Time Accessibility	Adjusting Flexibility Accessibility Normalisation
Personal Priorities	Situation Family Stress	Situation Family	
Travel	Distance Reduction Conditions Carbon	Distance Reduction Seminar Location	
Rural/ Remote	Isolation CME Resources	Isolation	

The results from all seven main themes established from the raw data were analysed separately and are presented separately below. Each key theme contains a separate table including its related subthemes. All identifying information was excluded from the extracts provided to maintain the anonymity of the participants. The themes, and sub-themes within each main theme, are presented by level of significance starting with the most significant. Level of significance was determined by rating the themes on how well they represented the raw data set as a whole.

Main theme: Group culture

Group culture was a major theme from all three focus groups; offsite registrars, onsite registrars, and facilitators. Group culture is defined as the relationships between and within the group. Within the theme of group culture there are four sub-themes; bonding, dynamic/identity, size, and maintaining. Bonding and group dynamic/identity were the top sub-themes for all three groups. Priority of the subthemes was determined by how they explained and encapsulated the raw data set. The subthemes that were more easily determined were considered more significant to the tone of the focus groups and the participants experience with teleconferencing. Further, group size was an important factor for both registrar groups with them all agreeing they were lucky with the small (three) even size of both groups. All the registrars experienced face to face training for the first few months and when travel became too difficult for the offsite registrars switched to teleconferencing. The offsite registrars mentioned maintaining the group culture once they switched to teleconferencing. Group culture was essentially the most important theme for all three groups. Establishing group culture prior to teleconferencing was acknowledged by all as a key priority. All three groups agreed once group culture was established teleconferencing could easily maintain the existing relationship, however, it would be difficult to establish a

relationship if the offsite registrars had teleconferenced for the whole year. Table two below indicates the main theme of group culture and the subthemes that relate to each group in level of importance, with most important at the top.

Table 2: First Main Theme: Group Culture

Group Culture			
Group	Offsite Registrars	Onsite Registrars	Facilitators
Subthemes of Group Culture	Bonding	Bonding	Bonding
	Dynamic/ Identity	Dynamic/ Identity	Dynamic/ Identity
	Size	Size	
	Maintaining		

Sub-theme: Bonding

All groups collectively stated the importance of face to face bonding to establish group culture prior to teleconferencing. The facilitators stated the importance of establishing group culture at the beginning of the year otherwise the teleconferencing registrars may have felt isolated.

“...if they didn’t have that group culture set up at the start it could be completely different story um they may feel a bit isolated...”

The offsite registrars communally agree it was crucial for group bonding to occur prior to teleconferencing.

“...I think it was definitely important that we did all meet up a few time first because you would feel a bit removed I think if you hadn’t really met anyone before...”

Further, the onsite registrars supported the importance of bonding with the offsite registrars prior to losing them to the screen. They had formed a friendship as one group which made teleconferencing easier.

“...knowing people and that’s sort of something that develops face to face and I think it was advantageous the way that it worked out that it was there were a few weeks you know for the first part of the year that you know that they were they were coming over and we got to know each other...”

Further, the facilitators felt the initial face to face bonding allowed the group to remain functioning as one group rather than two separate groups once teleconferencing commenced.

“...the impression that I got was that the group still functioned as one group...”

While the offsite registrars agreed that the group still functioned they stated the spilt allowed for closer bonding of the separate groups.

“...it probably made us tighter didn’t it made us tight us three...”

Sub-theme: Dynamic/identity

The group dynamic/identity was mentioned by all three groups. The offsite registrars felt the group dynamic was very unique as they formed a strong bond during orientation.

“...some of that is how the whole group dynamic was anyway is that we all got on really well with each other...”

The facilitators noted the group dynamic/identity was well established prior to teleconferencing and the group dynamic was maintained by occasional face to face meetings.

“...I didn’t really notice much difference to be quite honest I think partly because we started off with group culture formed um then we started using telehealth so the group culture was already there um and we did meet from time to time to um and it maybe depend on the numbers as well because there was sufficient numbers either side...”

However, the onsite registrars felt teleconferencing changed the group dynamic by dividing the registrars into two separate groups.

“...yeah its sort of the dynamic that has changed but from our learning it’s unchanged...”

“...it wouldn’t have had any impact but because we had them at the beginning it’s divided us really it’s separated us...”

Further, the onsite registrars agreed that it was nicer having everyone in the same room but they understood that there were confounding factors that made it difficult.

“...for me it was nicer having people here but I totally understand their need to travel difficult and I don’t think I’d like to do the travel if possible...”

Nevertheless, the offsite registrars felt the group remained close and the seminars remained a safe place to share sensitive information.

“...even doing it via video it was still a nice a nice place to if we had got upset about something or we thought we had really um stuffed something up then it was still a safe place to do that...”

Sub-theme: Size

The offsite registrars stated teleconferencing worked because there were two even small groups which allowed them to communicate on a deeper level with more awareness about what it going on at the other end. The key to teleconferencing is small, but more than one person, groups as they are easily managed and everybody is actively involved.

“...teleconferencing it would be quite isolating but because it was two small groups I think that’s what made it function...”

The onsite registrars supported the notion that the small even group size was very important as they could clearly communicate with each other. Further, they noted the importance of a supportive network while teleconferencing, one person teleconferencing would be very isolating.

“...for next year I think for one person in... it will be a lot harder for that person a lot harder to do telehealth...”

Additionally, the offsite registrars stated their group size had the right balance as teleconferencing would not work with large group. The registrars stated it took a lot more concentration and facilitation in order for their group size to work, if more people or groups were added that their education may have suffered.

“...if your groups gets to more than eight nine people on a camera you're not going to see them...”

Sub-theme: Maintaining

The offsite registrars were the only group to mention the efforts made to maintain the group culture. The offsite registrars successfully maintained a close bond as one group as they occasionally travelled to the seminars in an effort to maintain the group culture once teleconferencing.

“...there really only was a couple of other times that we went over and it was really just to see them face to face again...”

Main Theme: Facilitation

Facilitation was a major theme for all three focus groups. Within the theme of facilitation there are three sub-themes; active facilitation, teleconferencing differences, and

experience teleconferencing. Facilitation, as well as group culture, was seen as a major contributor to the success of teleconferencing. The quality to facilitation was reliant on the facilitator’s ability and professional talent. Active facilitation was viewed by all groups to be the most important aspect of facilitation. Overall, the registrars agreed that they ‘lucked out’ with the facilitators and felt that it may have been a different story had they not had supportive facilitators. The facilitators noted very little difference between traditional face to face facilitation and teleconferenced facilitation. Thus, the qualities that make a good facilitator are no different from face to face compared with teleconferencing. Table three below indicates the major theme of facilitation and the subthemes that relate to each group in level of importance, with most important at the top.

Table 3: Second Main Theme: Facilitation

Facilitation			
Group	Offsite Registrars	Onsite Registrars	Facilitators
Subthemes of Technology	Active Facilitation	Active Facilitation	Active Facilitation
	Teleconferencing-Differences	Teleconferencing-Differences	
			Experience-Teleconferencing

Sub-theme: Active facilitation

All groups agreed that active facilitation was crucial to the success of teleconferencing. The offsite registrars stated active facilitation was crucial in keeping them on task, focused, and ensuring they were actively included throughout the seminar.

“...it is very much dependent on who is there as well in the room and the facilitator...”

“...sometimes we would get a bit distracted because you can get distracted when you haven’t got people sitting in front of you...”

Teleconferencing has to be actively facilitated to allow the individuals teleconferencing a chance to speak. The onsite registrars stated it would have been easy to ignore the teleconferencing registrars.

“...it has to be a lot more directed so like we would often go around the group and you know how’s your week been at the beginning and that involves them...”

Further, the onsite registrars credit the success and inclusion of the offsite registrars to the facilitator.

“...I think the facilitator’s gotten better at that inviting their comment on thing so they’re not ignored...”

The facilitators noted active facilitation while teleconferencing requires them to have regular checking in with the registrars to ensure they are getting the most out of the seminars.

“...I wonder whether if we had sort of check points along the way that we keep reminding yourselves of what the propose making sure that we are filling that you know is the program is for example is the program is it a good learning experience for the registrars are they being prepared appropriately for the role they are going to do...”

Sub-theme: Teleconferencing differences

The main differences in facilitation while teleconferencing was that the onsite registrars felt they had less time with the facilitator.

“...I guess we have the facilitator a bit less often...”

This notion was supported by the offsite registrars as they felt they dominated the facilitator’s attention and were worried the onsite registrars missed out, especially during more practical exercise such as role plays.

“...I feel sorry for the other guys actually because the facilitator would always sit right in front of the camera and the other three would just be left to their own devices...”

Sub-theme: Experience teleconferencing

The facilitator’s core feelings are that teleconferencing and face to face facilitation are inherently the same.

“...I haven’t experienced um any difference face to face and um telepaid pretty much the same um and it as convenient quite convenient for the registrars...”

The facilitators noted that there were differences while teleconferencing, less social interaction, but from a facilitation perspective the seminars worked as usual.

“...during the program obviously in the differences were there was um there was less social interaction during the breaks but actually the program um to me it felt very similar...”

Main Theme: Teleconferenced education

Teleconferenced education was a major theme for all three focus groups. Within the theme of teleconferenced education there are eight sub-themes;

- communication,
- room,
- guest speakers,
- role plays,
- disadvantages,
- establishing teleconferencing,

- baseline, and
- future teleconferencing.

This theme is very large and therefore contains more sub-themes. The differences between the groups experience with teleconferencing came across through their individual references to the teleconferenced education. For the offsite registrars teleconferencing was course saving and therefore their experience was predominantly positive. The onsite registrars did not have to teleconference, and the overall finding suggests they felt teleconferencing added nothing to their education. Overall, the facilitators were satisfied and pleased with the standard of education provided for both the face to face and teleconferencing registrars. The general rule was that teleconferencing provided a good education to the registrars who could not travel to the seminars and the exception was a few guest speakers failed to properly address the offsite registrars. Table four below indicates the major theme of teleconferenced education and the subthemes that relate to each group in level of importance, with most important at the top.

Table 4: Third Main Theme: Teleconferenced Education

Teleconferenced Education			
Groups	Offsite Registrars	Onsite Registrars	Facilitators
Subthemes of Teleconferenced Education	Communication	Communication	Communication
	Room	Room	
	Guest Speakers		Guest Speakers
	Role Plays	Role Plays	
	Disadvantages	Disadvantages	
	Establishing-Teleconferencing		
		Baseline	
	Future-Teleconferencing		Future-Teleconferencing

Sub-theme: Communication

Communication was a key factor in the offsite registrars feeling included. Overall the groups agreed teleconferencing was a great tool to communicate because you could see facial expressions. However, the onsite registrar had to actively allow the offsite registrars a chance to interact to ensure they were included.

“...we have to learn to give each other turns cause they often missed out on the start because they would get cut off then we would stop and then they would stop so it wasn't probably as easy on them...”

One facilitator stated that communication has to be actively facilitated with traditional face to face training as well as teleconferencing. The vehicle of communication is not as important due to the recent advances in technology.

“...it's not really too much the vehicle of communication as long as it's being conducted well on that vehicle...”

However, the offsite registrars felt the communication was not as fluid as it had been face to face. The physical cues were not as easily read while teleconferencing and they often felt they were interrupting.

“...the only thing you don't get on the teleconferencing is like the physical cues that you want to ask a question you know and so sometimes I felt like you are really interrupting the speaker...”

Further, communication could be easily disconnected as the teleconferencing unit was sometimes muted and the separate groups would have their own discussions.

“...they mute themselves sometimes and we don't know what they are saying...”

Sub-theme: Room

There was no room in the offsite town dedicated to the weekly teleconferenced seminars which often meant the offsite registrars had to change rooms up to three times daily. Room changes would often happen during guest speaker's presentations and the registrars missed out.

"...it would be better if there was a designated room that was one of the huge downsides of it I would get absolutely livid at how we had to change rooms two or three times a day..."

Although it did not directly affect the onsite registrars they noted room location as an issue that needs addressing. The room changes highlighted a lack of coordination within the program.

"...better coordinated would be would make it better especially for the guys who have had to move rooms and it's not you know if there was the infrastructure to say this is all here its set up and ready to go not you have to try to find a room at the hospital that you can stay in and then you might have to change if there is a meeting..."

Sub-theme: Guest speakers

Majority of the guest speakers were based in the onsite town and had worked with the onsite registrars. The offsite registrars sometimes felt that they were being ignored.

"...occasionally like we wouldn't get introduced to like the people would know the speakers because they had worked with them but we wouldn't know them and we would be sitting there who's that..."

The facilitators acknowledged that some guest speakers failed to address the offsite registrars as effectively as the onsite registrars; however, they saw this as the exception not the rule.

“...one or two speakers um just needed a bit a constant reminder about the um registrars so that that was exception and the rule was even with the speaker I felt it went well...”

Teleconferencing highlighted any disorganisation. Guest speakers needed advanced warning that they were teleconferencing so they could have sent handouts as emails prior to the seminar so the offsite registrars could get copies printed.

“...what I think would make it even better is knowing that we were having teleconferences the people that were coming to present would be told its going to be a teleconference if there are any handout could you please email the information cause I felt quite disadvantaged that they would have all these handouts...”

Sub-theme: Role plays

The offsite registrars still managed role plays despite the fact they were teleconferencing. The facilitator ensured the offsite registrars were included and left the onsite registrars to their own devices.

“...we still managed role plays...I feel sorry for the other guys actually because the facilitator would always sit right in front of the camera and the other three would just be left to their own devices...”

However, both the offsite and onsite registrars felt that role plays were better face to face as there was more variation. The registrars got too familiarised with the way their peers consulted.

“...when we were role playing with every one we mix it around and it would be every one since they have been...since they’ve been teleconferencing they do their role plays together we do our role plays together...”

“...we all got very use to how one another consults...”

Sub-theme: Disadvantages

Teleconferencing highlighted any disorganisation with the seminars. The GPEP-1 training program was set up to be delivered face to face, thus, teleconferencing presented new problems that were not noted prior to the start date.

“...I think being on teleconference highlighted the disorganisation cause to for teleconference to work it needs to be well organised and like I said they need to have their paper you know handouts pre-sent in and handed out so it just highlighted the fact that if there was any disorganisation being on teleconference highlights any of that...”

For the offsite registrars access to a dedicated room or lack of, was also a constant problem and had a disruptive effect. Teleconferencing presented new issues that were not experienced in the face to face training and they negatively impacted the offsite registrars experience. The registrars needed unlimited wireless access to download any course handouts and gain access to a printer.

“...internet access and a printer we need a printer...”

However, for the onsite registrars the disadvantage of the offsite teleconferencing meant there was less social interaction.

“...we are missing out on any experience that they have that might be relevant to us and we are not sharing our experiences with them...”

Sub-theme: Establishing teleconferencing

Teleconferencing was established so the offsite registrars could travel less. At first the registrars were worried about the education provided via teleconferencing, however, this proved to be unfounded.

“...with the whole teleconference thing if for it to have actually all started cause there was the there was it all been discussed that it was probably going to happen but we were actually all quite afraid of it happening...”

Teleconferencing took into consideration the learning side as well as personal situations of the registrars.

“...it helps out with the learning the education side of things but it also take into account the emotional side of learning and travelling which I think is quite often forgotten um by helping with the emotional side of things it helps your learning as well...”

Further, the offsite registrars were impressed with teleconferencing and would happily enrol in other courses that offered it as an option.

“...I would be happy to do any sort of teleconferencing for any other subject really...”

Sub-theme: Baseline

Teleconferencing did not affect the onsite registrars as their Wednesday schedule remained the same. They were the baseline and it was easy for them to make it work as nothing changed apart from the group size in the seminar room. They noted the challenge of teleconferencing lies with the offsite registrars who teleconferenced.

“...the challenge for the um I think it is on their side I mean they don't we've got a facilitator here at all times they are relaying on a facilitator to join them at lunch time and

we use to branch off at lunch time and then they would have the afternoon with one on one and role plays and things it's their I mean it's very easy for us to make it work its more difficult for them..."

Sub-theme: Future teleconferencing

The facilitators were already looking to the future of teleconferencing with the next logical step being a longitudinal study comparing this group with next year's group which consists at this point in time of only one person teleconferencing in as an offsite registrar. This would establish a comparative study of different types of teleconferencing rather than face to face compared with teleconferencing.

"...I think that that will be a very interesting comparison with next year's group that does have I guess looking at the difference between having the telehealth as an individual or as a group..."

For future years the offsite registrars agreed it was important to know ahead of time what each seminar would entail in order for the registrars to organise travel when it was vital.

"...yeah the college could I guess properly organised once a month to go over and have things like minor surgery on those day..."

Main Theme: Technology

Technology is the fourth and final theme that applied to all three groups. Within the theme of technology there are eight sub-themes;

- adjusting,
- flexibility,
- lag time,

- confidentiality,
- emotional distant,
- support,
- accessibility, and
- normalisation.

Technology was mentioned by all three groups. Overall the three groups agreed that the technology was brilliant with the exception of a few kinks that needed ironing out. Further, all groups saw the potential for the technology to take the course to the next level and with more understanding and education around the technology the participants felt that teleconferencing could do more than connect the offsite registrars to the seminars. One offsite registrar did state teleconferencing could be quite emotionally isolating, however, the active facilitation and the strong established group culture helped prevent the offsite registrars feeling isolated. Over time and through the process of normalisation all participants agreed teleconferencing could become a permanent feature of rural GPEP-1 training seminars. Table five below indicates the major theme technology and the subthemes that relate to each group in level of importance, with most important at the top.

Table 5: Fourth Main Theme: Technology

Technology			
Group	Offsite Registrars	Onsite Registrars	Facilitators
Subthemes of Technology	Adjusting	Adjusting	Adjusting
	Flexibility	Flexibility	Flexibility
	Lag Time	Lag Time	
	Confidentiality		
	Emotional Distant		
		Accessibility	Accessibility
			Normalisation

Sub-theme: Adjusting

The overall consensus was there were very few technical problems during the period while the registrars teleconferenced. The offsite registrars noted how user friendly the teleconferencing unit was.

“...I found it really easy and simple surprisingly simple...”

Further, the offsite registrars also noted that there were a few minor issues that needed fixing. It was trial and error at the start as the registrars had little experience teleconferencing.

“...I had no idea how to use it before but we all...yeah we got there in the end...I mean it's great but little things need to be ironed out...”

The onsite registrars noted the potential use for the teleconferencing technology. The teleconferencing technology was only used to fulfil the basic need of a live interactive video link, however, further advanced use of the technology was considered.

“...I am sure there are ways that the technology could be better used as well I know as a medical student we were doing the teleconferencing with power points we could get it so the power point was put fully on the screen with just an inset of the room so when it when it was a power point you could be watching the slides and then you could flip back to the to the presenter and there are ways of doing that um through telehealth...”

The facilitators agreed that teething problems were inevitable; however, the technology fulfilled its purpose of educating the offsite registrars at a standard similar to face to face.

“...from the facilitator point of view its great and I think it's got um it's got big potential for us and even with the teething problems the challenges that we had um and from

the facilitator point of view I just like the to make use of the technology um to achieve what we want to and that's ideally to um make it better for the better for remote um ah registrars to be included and learn and not be disadvantaged... ”

Sub-theme: Flexibility

All three groups stated that any flexibility associated with teleconferencing was the offsite registrar's ability to learn at a distance. The onsite registrars expressed teleconferencing as a more appealing option than travelling; however, the offsite registrars could still travel when they desire.

“...there were weeks where someone came over and someone teleconferenced just depending on who could come over or where it suited them to come over...”

The offsite registrars supported this claim by detailing how they were able to pick the method of learning that best suited their needs. Teleconferencing provided the registrars with the option of travelling or staying and teleconferencing.

“...there was one time yeah when you when...was away you went over and I stayed and teleconferenced that was the very first week...”

Further, the trainers noted that original plans for teleconferencing adapted to suit the registrars. Teleconferencing allowed for less travel than anticipated.

“...we had a plan initially to do three weeks um with telehealth then once a month we will meet up but the registrars said that they are happy with the way things are and um again the flexibility with this system that you can always um adapt so if there is need for it you can still go...”

Sub-theme: Lag time

A negative aspect associated with teleconferencing was the small lag time in the technology delivery; however, the offsite registrars were unaware of this fact. The offsite registrars thought they were getting ignored which made them aware of the distance. The registrars mentioned the need for future programs to investigate and reduce the lag time.

“...I use to think that we were getting ignored but it’s actually cause there is a lag time...”

Whereas the onsite registrars were frustrated with the lag time as it made it more difficult for them to involve the offsite registrars in discussions.

“...sometimes there is that moment of someone talking oh no you’re talking oh no we are talking yeah you know it takes that that second longer for it to come through...”

Sub-theme: Confidentiality

The offsite registrars were the only group to mention confidentiality. Confidentiality was a concern as the teleconferencing room was not sound proof and their conversations could be heard in neighbouring rooms.

“...so it would be better to have you know like a private sort of area...”

Sub-theme: Emotional distant

The offsite registrars were also the only group to mention the emotional distance they experienced while teleconferencing. The offsite registrars claimed there was an emotional distance that came with teleconferencing that could be very isolating. Whilst teleconferencing the registrars were aware of the distance between themselves and the facilitators and onsite registrars, however, they never felt disadvantaged.

“...I don’t think I was disadvantaged but the um the emotional connection was slightly less...”

Sub-theme: Accessibility

The onsite registrars noted that accessibility to the teleconferencing units was a struggle. The college was borrowing equipment and are yet to upgrade, however, the PHO is looking at setting up services to accommodate the programme. Nevertheless, the start up costs are substantial and the college will not invest unless the rewards outweigh the costs.

“...we are borrowing their equipment there’s no the GP College isn’t going to pay to upgrade...”

The facilitators also note the key factor to the success of teleconferencing this year was availability/accessibility of the telehealth unit. The local DHBs and PHOs were vital in providing support and accessibility of the technology.

“...availability of um or access to technology so um especially um this year what we have been doing we have been using different rooms at different times and I am really grateful that the DHB did offer that support otherwise there was no way that we could have made it happen...”

Sub-theme: Normalisation

Normalisation of teleconferencing from the beginning is a key requirement to its success. The registrars involved with teleconferencing need to be familiarised with the concept and process as well as the facilitators and guest speakers involved. The facilitators noted that in order for any new educational system to work it has to be integrated into every aspect of training.

“...normalisation of system early on and um I guess developing new process where the system sort of becomes increasingly anchored as part of the culture of the training program...”

Regular check-ups were the key to providing fluid communication to ensure everyone onboard is satisfied and achieving what they wanted from the teleconferencing seminars.

“...I guess acknowledging linguistically what’s going on and checking that everybody is all feeling heard and that the communication is going okay...”

Main Theme: Personal priorities

Personal priorities was a major theme for the offsite registrars, as validation for switching to teleconferencing, as well as the onsite registrars, as they acknowledged that personal reasons experienced by the offsite registrars were contributing reasons why they could no longer travel. Within the theme of personal priorities there are three sub-themes; situation, family, and stress. Personal priorities were predominantly related to the offsite registrars as it demonstrates their reasoning for teleconferencing. The strong established group culture meant that the onsite registrars also acknowledged the offsite registrars needed to travel less. Overall, reasons for teleconferencing were situational based and certain situations made it impossible for the offsite registrars to continue travelling. Table six below indicates the major theme personal priorities and the subthemes that relate to each group in level of importance, with most important at the top.

Table 6: Fifth Main Theme: Personal Priorities

Personal Priorities			
Group	Offsite Registrars	Onsite Registrars	Facilitators
Subthemes of Personal Priorities	Situation	Situation	
	Family	Family	
	Stress		

Sub-theme: Situation

Whether or not the registrars choose to teleconference or drive depended on their personal situation. Due to personal situations the offsite registrars switched to teleconferencing. As one onsite registrars stated the switch came out of necessity.

“...sometimes they were actually missing sessions because kids were sick...”

Reasons for switching to teleconferencing have to be assessed on a situational basis. The offsite registrars were at breaking point, they were ready to quit if the seminars continued to include long distance travel.

“...I would have packed it in if the teleconference didn't happen...a few people almost got to their breaking point that week when I refused to drive over was my breaking point...”

Further, the offsite registrars were aware that the problem was theirs as to why they could no longer attend the face to face seminars.

“...I think that was an us-factor that we couldn't go...”

Personal situations meant that all the offsite registrars could no longer travel which led to them switching to teleconferencing. Thus, once the registrars switched the benefits were experienced for them personally. Further, the onsite registrars saw no benefits as they experience no need to switch.

“...they have had the benefits and that's all to do with their personal situations and whether they can make it or not to seminars it would have been better overall if we didn't have to do this but that's life...”

Sub-theme: Family

Family was a key factor in the offsite registrars' decision to teleconference. Two out of three of the offsite registrars had young children and teleconferencing meant they were closer to their children if anything happened.

"...knowing that my daughter sick back here and if anything happened it was going to take me two hours..."

Further, Wednesday was a very long day for the offsite registrars with travel. However, the onsite registrars explained Wednesday as their shortest day. The onsite registrars stated for the off registrars teleconferencing was a more appealing option than missing out or travelling.

"...it's not whether they're here or teleconferencing because here is not an option its teleconferencing or nothing..."

Additionally, the offsite registrars experienced a huge amount of stress with driving so far away from their children. The registrars were preoccupied with worrying about their children that their education came second.

"...being within closer proximity if there was an issue with the kids you wouldn't have had to drive over that hill for like an hour and half going oh my god ..."

Thus, teleconferencing meant that the offsite registrars had flexibility to fulfil their family and educational commitments.

"...so the kids are sick can't go to Nelson today or have to get them to a doctor's appointment...I can still do that and teleconference..."

Sub-theme: Stress

The offsite registrars experienced unmanageable amounts of physical and emotional stress while travelling to and from the seminars. The switch to teleconferencing helped relieve the registrars of the stress associated with travel.

“...there was a physical stress from the driving but I think there was probably an emotional stress as well...”

Main Theme: Travel

Travel was a major theme for both the offsite and onsite registrars. Within the theme of travel there were five sub-themes,

- distance,
- reduction,
- conditions,
- carbon, and
- seminar location.

The offsite registrars experienced a huge change in travel when they switched to teleconferencing. The offsite registrars all agreed that travel was; long, stressful, and overall a major issue for them. The reduction they experience during the switch to teleconferencing was viewed by all as a benefit with few trips made once they switched. On the other hand the onsite registrars all had small commutes to the training seminars. The onsite registrars agreed the overall benefit of teleconferencing was the reduction in travel, which was experienced by the offsite registrars. The onsite registrars agreed that they received no overall benefits from teleconferencing as their travelled remained the same throughout the entire year. Travel was

not a major theme for the facilitators. Table seven below indicates for which group travel was a major theme and the subthemes for each group in level of importance, with most important at the top.

Table 7: Sixth Main Theme: Travel

Travel			
Group	Offsite Registrars	Onsite Registrars	Facilitators
Subthemes of Travel	Distance	Distance	
	Reduction	Reduction	
	Conditions		
	Carbon		
		Seminar Location	

Sub-theme: Distance

Distance travelled to the onsite training centre was extremely different for the two respective groups. The offsite registrars all agreed that it was a long distance to travel for one day.

“...yeah so I Google mapped it this morning it’s a hundred and seventeen kilometres each way...”

Further, the offsite trainers went on to state that once they arrived parking was an issue.

“...they asked us not to park in the park over there too...”

As for the onsite registrars the distance of travel for them to the training centre was not an issue as they all lived within a relatively short commute.

“...we all live within a few kilometres...”

Sub-theme: Reduction

The reduction in travel to the Wednesday seminars was an important factor in the offsite registrar’s decision to switch to teleconferencing.

“...I would have packed it in if the teleconference didn’t happen...that week when I refused to drive over was my breaking point...”

Originally the registrars planned to make the trip to the seminars once a month, however, in reality they travelled much less.

“...there really only was a couple of other times that we went over and it was really just to see them face to face again...”

The onsite registrars stated the overall benefit of teleconferencing is the reduction in travel for the offsite registrars.

“...the overall benefit is for them for not having to travel all the time...”

Sub-theme: Conditions

Condition refers to the driving condition to and from the Wednesday seminars. The offsite registrars were the only group to mention the travel conditions and all stated huge amounts of stress with driving over to the weekly seminars. The road to the seminars was dangerous and they often had to take alternative routes due to crashes, which added additional time to their commute.

“...it’s a really dangerous road...”

Further, one offsite registrar felt that her education was being affected by the stress she endured driving to the Wednesday seminars.

“...I felt that it probably um made my education better than what it would have been if I had drove over just because of this stress of driving over um and the time that it was taking so I could focus better...”

Sub-theme: Carbon

The only group to mention carbon cost and savings were the offsite registrars as they were the only ones travelling long distances to reach the seminars. The registrars used multiple transport methods commuting to the Wednesday seminars, boat and car fuel. Family commitments made it difficult for the registrars to car pool.

“...so for the first few weeks we went in separate cars and so and I did have the thought in the back of my in the back of my mind really....of petrol it's really not great for the environment or for having two cars...”

However, they were concerned about the carbon emission produced by travelling separately and eventually decided to car pool.

“...I basically said look this is silly why don't was actually just all car share you know three of us go in one car each week and if one of you needs to get back for your kids we just all go back that's not a problem...”

Main Theme: Rural/remote

Rural/remote was a main theme for the offsite and onsite registrars but was not a main theme for the facilitators. Within the umbrella of rural/remote there were three sub-themes; isolation, CME, and resources. Rural/remote was a concern for the offsite registrars as they lived in a smaller town than the onsite registrars and therefore were geographically located further from the training seminars. Both groups mentioned that it would benefit their local PHO's to obtain teleconferencing units to help train rurally located GP registrars. The theme of rural/remote was mainly a feature of the offsite registrar's focus group. Overall teleconferencing was perceived to help overcome the difficulties associated with CME for

individuals living rurally. Table eight below indicates the major theme rural/remote and the subthemes that relate to each group in level of importance, with most important at the top.

Table 8: Seventh Main Theme: Rural/Remote

Rural/ Remote			
Groups	Offsite Registrars	Onsite Registrars	Facilitators
Subthemes of Rural/Remote	Isolation	Isolation	
	CME		
	Resources		

Sub-theme: Isolation

Living in a rural town can be very isolating. Rural communities experience a lack of resources that is not experienced in urban centres. The offsite registrar’s stated there needed to be more understanding and provision around practicing rurally as it is uniquely different to urban practice.

“...I think that there needs to be a bit of an understanding within especially generally practice in New Zealand but so much of it is not done in a city and actually there is so much of it that it done rurally and there need to be a kind of provision for that...”

Rural/remote townships still have health care needs and benefit from having well trained medical professionals living in their community.

“...I see that we are in a rural area and we are benefiting the community by wanting to do this sort of stuff living here...”

Further, the onsite registrars note it would benefit the PHO to set up teleconferencing units to attract GP registrars to; study, work and live in remote areas.

“...it would be them benefit the PHO in the long run having a better supply of GPs in the region...”

Sub-theme: CME

The offsite registrars are no longer disadvantaged educational wise as teleconferencing supports CME despite the fact they live remotely.

“...you still get the chance to be involved in continuing education but you just don't have the travel commitments but you still got access to all the best resources that everyone else does...”

Further, one of the registrars was already looking into other courses offering telehealth training options.

“...I have looked into a couple of courses that I would like to do and they are mainly based in Wellington or Auckland or Christchurch and if I can open my doors to other training thing to better my career as a GP through teleconferencing yeah I would definitely...”

Sub-theme: Resources

Further, working in a rural town is completely different to working in the city where specialists are in close proximity.

“...is a whole different kettle of fish to working in Auckland where you know you've got that proximity of every specialist you could ever need...”

There are fewer resources rurally and accessibility to medical information located in urban centres requires travel or electronic forms available online.

“...you can't get access to stuff like you can in the big cities...”

Summary

The above results will now be discussed in the next chapter, chapter five: discussion, in relation to the reviewed literature from chapter two and the studies aims. The two aims of this study were to examine whether the telehealth training approach for general practice registrars is as effective, in terms of their clinical and educational learning experience, as traditional face to face training and also to examine the effects of the telehealth training approach in terms of social networking. All recommendations for future use of telehealth for CME delivery will also be presented.

Chapter Five

Discussion

Introduction

This study set out to investigate the experience of all nine individuals involved in the teleconferenced General Practice Education Programme (GPEP-1). The participants were separated into three groups; offsite registrars, onsite registrars, and facilitators. The offsite registrar group consisted of the three registrars that lived in a town approximately 114 kilometres distance from the city that hosted the seminars. The onsite registrar group consisted of the three registrars who lived in the host city of the seminars; they all lived within a few kilometres from the seminar location. The facilitators group included; the GPEP-1 medical educator, the offsite facilitator (who was geographically located in the same town as the offsite registrars), and the onsite facilitator (who was geographically located in the same city as the seminars and onsite registrars). Three focus group interviews were conducted, one for each of the respective groups, and the interviews were audio recorded and transcribed. Liamputtong (2009) warned that focus groups can only represent the perspective of the participants involved. Thus, the results from this study can only represent the groups involved in the focus groups. The present study included everybody involved in the pilot study and therefore the results accurately represent the experience and perspective of the pilot study as a whole. The raw data sets were analysed separately following Braun and Clarke's (2006) six step guideline to thematic analysis. This study set out to investigate the experience of each participant with teleconferenced CME. Education outcomes were not the focal point of this research as the level of competency of the registrars to successfully pass GPEP-1 was assumed at their level of professional training. Tele-education is costly; therefore, poorly structured programmes have the potential to waste large amounts of money and time.

Consequently, simultaneous evaluation of tele-education programs are required to ensure the program fulfils its purpose (Catwell & Sheikh, 2009; Sandars, 2011).

Key findings

The key findings of this study were the seven main themes presented in chapter four: results, which include; group culture, facilitation, teleconferenced education, technology, personal priorities, travel, and rural/remote. Each main theme had at least three subthemes that together defined the main theme. The main themes and subthemes were listed in level of importance as determined by how well they represented the raw data. The main theme group culture had four subthemes; bonding, dynamic/identity, size, and maintaining. The main theme facilitation had three subthemes; active facilitation, teleconferencing differences, and experience teleconferencing. The main theme teleconferenced education comprised of eight subthemes; communication, room, guest speakers, role plays, disadvantages, establishing teleconferencing, baseline, and future teleconferencing. The main theme technology included seven subthemes; adjusting, flexibility, lag time, confidentiality, emotional distant, accessibility, normalisation. The main theme personal priorities consisted of three subthemes; situation, family, stress. The main theme travel consisted of five subthemes; distance, reduction, conditions, carbon, and seminar location. The main theme rural/remote included three subthemes; isolation, CME, and resources.

The key findings of this study can be separated into two groups; key themes that support reasons for switching to teleconferencing and key themes that determined the success and failure of teleconferencing. The key themes that supported reasons for switching to teleconferencing included; personal priorities, travel, and rural/ remote. The key themes that supported reasons for switching to teleconferencing were not applicable to the facilitator focus group, only the offsite registrar and onsite registrar focus groups.

Alternatively, the key themes that determined the success and/or failure of teleconferencing included; group culture, facilitation, teleconferenced education, and technology, and were applicable to all three focus groups.

Switching to teleconferencing

The three main themes that supported reasons for the offsite registrars to switch to teleconferencing included; personal priorities, travel, and rural/remote. These main themes were applicable to both the offsite registrar and onsite registrar groups; however, none of these three main themes were relevant to the facilitators' focus group. As Sandars (2011) noted videoconferencing is cost saving for individuals who seek CME as it offers a cheap, user friendly alternative education to traditional face to face education. The offsite registrars noted the reduction in travel costs to the onsite seminars as an appealing factor for switching to teleconferencing. As Hailey (2005) found the cost associated with telehealth is much higher for the provider than the learner. In order for a switch from traditional face to face training to teleconferencing training the latter has to be more appealing. For the offsite registrars the reduction in travel alone justified their need to switch to teleconferencing. Additionally, family commitments as well as their personal situations led the offsite registrars to switch to teleconferencing. Further, the major benefits from teleconferencing were predominately experienced by the offsite registrars. The onsite registrars experienced no need to teleconference and their seminar day remained the same throughout the year, therefore, teleconferencing provided them no benefit. The reasons for switching to teleconferencing such as, cost, travel, family, are often the areas that benefit from the switch over. Further, an additional benefit of telehealth is often the recruitment and retention of rural health workers to practice in rural

communities. However, as this study was a pilot study benefits for the program were not experienced as implementation was to satisfy the registrars who were already enrolled.

Personal priorities

The offsite registrars involved in the GPEP-1 training pilot started off the year travelling to the onsite city, approximately 114 kilometres distance, to attend the seminars face to face. However, the registrars' personal situations meant they could no longer travel and teleconferencing offered a means for them to continue involvement with the weekly seminars without travel. Long distance travel has long been considered a leading factor for GPs to avoid rural practice CME (Lu et al., 2008). The offsite registrars noted both emotional and physical stress with driving which negatively affected their concentration and thus educational experience. Reilly et al. (2012) noted the importance of learners' emotions as complex and warned negative emotions could negatively affect focus on cognitive processing. However, Reilly et al. (2012) stated educational experiences are usually experienced on a continuum of emotions, both positive and negative. The reasons for switching to teleconferencing were experienced solely by the offsite registrars and once they switched the benefits of teleconferencing were again solely enjoyed by the offsite registrars. Schoen et al. (2009) highlighted the use of internet based programs as the most viable option for busy physicians' CME, thus, supporting the reasons for rural registrars switching to teleconferencing. However, the urban based or onsite registrars, who all lived within a few kilometres of the seminars, personal situations allowed for them to attend the weekly seminars. Therefore, the onsite registrar saw no benefits for themselves.

"...they have had the benefits and that's all to do with their personal situations and whether they can make it or not to seminars it would have been better overall if we didn't have to do this but that's life..."

Ultimately family commitments were major factors for the offsite registrar's choice to teleconference. Two out of three of the offsite registrars had young children which meant they occasionally missed out on the seminars. Further, when they did attend the seminars they felt stressed from being far away from their children, which affected their ability to concentrate. The offsite registrars choose between teleconferencing and face to face seminars due to their personal situations. However, the important factor in switching was ultimately less travel, which directly impacted the registrars' stress levels and helped them focus on their studies.

Travel

The distance travelled by the two respective registrar groups was extremely different. The offsite registrars noted the long treacherous drive to the onsite seminars, whereas, the onsite registrars experienced a relatively short commute to the weekly seminars. The differences in each group's respective travel meant they viewed teleconferencing from a completely different perspective. For the offsite registrar teleconferencing was a must and for the onsite registrars teleconferencing meant they missed their friends in the weekly seminars. Further, the onsite registrars had no reason to switch to teleconferencing as travel was not an issue, however, for the offsite registrars travel was an issue and a prominent reason to teleconference.

"...the overall benefit is for them for not having to travel all the time..."

When considering a change from traditional educational methods, face to face, the alternative option has to demonstrate greater appeal and improve the current situation (Hailey, 2005). Teleconferencing technology is costly for the provider and should be implemented to help cut costs were necessary (Sandars, 2011). The offsite registrars used multiple methods of transport to the seminars including; car and boat, therefore, the option

of teleconferencing was more financially appealing than travelling. Additionally, at the start they were travelling separately due to personal reasons, however, the offsite registrars collectively agreed that it was a waste of money and bad for the environment and decided to car pool. The cost to the environment as well as the registrars coupled with their personal situation meant weekly face to face options were no longer viable. Additionally, teleconferencing was course saving as the offsite registrars were at breaking point and were ready to pack in the course if they were required to continue travelling weekly.

“...I would have packed it in if the teleconference didn't happen...a few people almost got to their breaking point that week when I refused to drive over was my breaking point...”

The offsite registrar's travel significantly reduced when they switched to teleconferencing. The reduction in travel was a direct benefit of switching to teleconferencing. Further, the switch to teleconference did not limit them of face to face contact as the registrars were able to travel over to the seminars if required. The switch to teleconferencing gave the offsite registrars more options. Offering teleconferencing or online learning as a sole means of education is less effective than a hybrid approach (Murphy-Southwick & McBride, 2006). The option of face to face meetings reduced learners feeling of isolation while teleconferencing.

Rural/ remote

Living in a rural town can be extremely isolating (Larkins et al., 2004; McLachlan-Smith & Tracey, 2000). The distance between rural and urban communities often acts as barrier to CME (Chang & Trelease, 2001). Doorenbos et al. (2011) stated tele-health was developed to help deliver CME to geographically isolated communities. The offsite registrars noted there needed to be some sort of provision around rural practice in New

Zealand. Rural communities benefit from having well trained and qualified GPs living in their communities (Wearne et al., 2010); however, for the registrars the issue was completing their training while living rurally.

“...I think that there needs to be a bit of an understanding within especially general practice in New Zealand but so much of it is not done in a city and actually there is so much of it that it done rurally and there need to be a kind of provision for that...”

Currently, 15% of the New Zealand population live rurally and require quality healthcare and equal opportunities to CME (World Health Organization, 2009a). Janes et al. (2005) agreed rural health professionals had been disadvantaged with lack of options for CME and health information compared to urban centres. Teleconferenced CME offered the offsite registrars the opportunity to complete their GPEP-1 training. Further, one registrar even mentioned the possibility of enrolling in another course that offered online education to help improve her skills and knowledge base. Controversially, Carroll et al. (2009) stated traditional classroom learning as the most preferred learning style, even though e-health reduced isolation and distance barriers. However, there are generally fewer resources rurally and accessibility is limited without online access or travel to urban centres. The offsite registrars outlined how different working rurally was to urban practice, where specialist and unlimited resources are in abundance. Therefore, practicing rurally often requires a completely different toolset to urban communities (Wilkinson et al., 2003). A key finding of this study parallel to Maheu et al. (2002) findings that training and practicing rurally is beneficial to the rural community and local PHO and DHB.

“...I see that we are in a rural area and we are benefiting the community by wanting to do this sort of stuff living here...”

The offsite registrars were fortunate enough to have the option of travelling when they desired, a hybrid method of telehealth. Murphy-Southwick and McBride (2006) findings supported the notion of a hybrid approach to telehealth, offering both online and face to face education, as the most effective method of attracting health professionals to CME.

Determining the success and failure of teleconferencing

This study established four main themes that were associated with determining the success and/or failure of teleconferencing including; group culture, facilitation, teleconferenced education, and technology. All four of these main themes were applicable to all three groups, thus, all three focus groups mentioned the factors that determined the success and/or failure of teleconferencing. Teleconferencing entails costly initial backing for future rewards (White et al., 2001). This pilot study cannot be viewed in simple terms of black and white as there were levels of both success and failure throughout the training. Overall, the pilot study was a success as it fulfilled its intended purpose of providing CME to the offsite registrars. However, evaluation of the participants' experience noted areas of success and areas that needed improvement. Appraisal of the success and failure of the teleconferencing seminars is needed in order to modify its overall effectiveness and efficiency. Overall success of online learning depends on social presence of the learner and teleconferencing successfully connected the offsite registrars to the weekly Wednesday seminars (Mayne & Wu, 2011). Comparable to Janes et al. (2005) findings, this study found that positive characteristics associated with online CME included; flexibility and time savings, cost savings, and availability of resources. The registrars and facilitators levels of satisfaction with teleconferencing ultimately determined the success of the piloted teleconferencing GPEP-1.

Group culture

All three focus groups, offsite registrars, onsite registrars, and facilitators, noted it was thoroughly important to establish a strong group culture prior to teleconferencing. Group culture was critical in setting the tone of the seminars. A strong established group culture helped to reduced feelings of isolation for the individuals teleconferencing. Wearne et al. (2011) stated forging friendships online was difficult for participants. The onsite registrars stated that developing a strong bond was something that needed to occur face to face. This supports Midmer et al. (2006) findings that in order to develop a sense of community interactive communication is required; however, they also claimed this interactive communication could occur online. However, the focus groups involved in this study agreed face to face contact was crucial to develop a sense of community.

“...knowing people and that that that’s sort of something that develops face to face and I think it was advantageous the way that it worked out that it was there were a few weeks you know for the first part of the year that you know that they were they were coming over and we got to know each other...”

The dynamic/identity of the group was also well defined that the seminars remained a safe place to share sensitive information while teleconferencing. Nothing major changed in the information exchanged; however, there was significantly less social talk. These findings are supported by the Wearne et al. (2010) study which stated participants’ rapport with one another and social networking were key determinants of the success of a training program. All three groups still felt the group functioned as one due to the quality bonding prior to the start of teleconferencing; however, teleconferencing fostered a closer bond within the smaller groups. Teleconferencing has proven as the number one method of telehealth as it supported interaction similar to face to face (Doorenbos et al., 2011). Further, group size was an

important topic touched on by both the offsite and onsite registrars. Both groups felt the balance was just right.

“...teleconferencing it would be quite isolating but because it was two small groups I think that’s what made it function...”

There were enough registrars in either group to avoid anyone feeling isolated, however, they were not too big that individuals were excluded. Further, the flexibility of teleconferencing meant the offsite registrars could travel onsite when they desired to maintain face to face contact. A factor that contributed to the success of this pilot study was that the group experience the first couple of months of seminars face to face before the offsite registrars switched to teleconferencing. The face to face seminars fostered a strong group bond that was easily maintained through teleconferencing.

Facilitation

Active facilitation was noted by all three groups, the offsite registrars, onsite registrars, and facilitators, as crucial to the success of teleconferencing. Without active facilitation the registrars felt their education would have suffered as the temptation to passively sit back was appealing. Further, the onsite registrars noted how easy ignoring the teleconferencing registrars would have been. Previous literature has demonstrated a positive correlation between facilitator’s involvement and participant’s participation (Curran et al., 2005). The facilitator made sure the offsite registrars were included and successfully included all registrars evenly. Supporting previous findings this study found that a lack of face to face interaction can leave participants feeling isolated, however, support from facilitators and other learners was an effective measure in reducing feelings of isolation (Bayley et al., 2011; Smith & Curry, 2005). The facilitators noted that regular checkups would be an effective way to ensure the registrars were getting what they needed from the seminars.

“...I wonder whether if we had sort of check points along the way that we keep reminding yourselves of what the propose making sure that we are filling that you know is the program is for example is the program is it a good learning experience for the registrars are they being prepared appropriately for the role they are going to do...”

Regular checkups ensure all participants are engaging as well as outlining areas where the facilitators need to focus. Therefore, participants received immediate feedback as they do in traditional class room learning situations (Curran, 2006; Wells & Dellinger, 2011). Teleconferencing allows for the relationship between the facilitator and registrars to adapt to meet the registrars’ needs (Wearne, 2005). The onsite registrars felt they had less time with the onsite facilitator while teleconferencing, however, they did not state concern for their education. The facilitators would have had to spend time with the offsite registrars had they attended the face to face seminars. Further, the facilitator’s felt the facilitation face to face and via teleconference were inherently the same. Thus, the characteristics that make an effective and skilled facilitator are the inherently the same for both face to face and teleconferencing seminars. Active facilitation is important to engage learners in both face to face and teleconferenced seminars; educational success depended on the quality of facilitation.

Teleconferenced education

Teleconferencing highlighted any disorganisation within the seminars. Teleconferencing required organisation and planning including; accessing teleconferencing technology, seminar print outs, seminar structure, and guest speakers. Therefore, communication was a key factor in the success of teleconferencing. The offsite registrars were apprehensive of teleconferencing prior to its commencement. The registrars were concerned about the level of education they would receive and felt they may be

disadvantaged, however, after the first teleconferenced seminar they realised their worry was unfounded.

“...with the whole teleconference thing if for it to have actually all started cause there was the there was it all been discussed that it was probably going to happen but we were actually all quite afraid of it happening...”

The offsite registrars believed they received the same educational experience teleconferencing and face to face, a notion supported by Shovein et al. (2005) and Wells and Dellinger (2011). Teleconferencing offered the offsite registrars two benefits; reducing travelling costs while maintaining the same academic outcomes as traditional face to face training. The evidence supporting equal educational experiences, with teleconferencing and face to face learning, assists in justifying the use of teleconferencing by demonstrating success and benefits compared to traditional educational learning for geographically isolated medical professionals (Midmer et al., 2006). Teleconferencing successfully left the registrars with a positive and open attitude toward further telehealth programs. The offsite registrars noted they would be happy to enrol in other CME courses that offered teleconferencing options and one of the offsite registrars had already begun looking into a few courses that offered online distance options. Communication affected the offsite registrars feeling of being included. Similar to Augestad and Lindsetmo (2009) findings, the offsite registrars preferred teleconferencing as it was live and interactive and allowed a communication similar to face to face. However, the communication has to be actively facilitated. Active facilitation allowed for communication to flow, nevertheless, the communication was not as fluid as face to face.

“...the only thing you don't get on the teleconferencing is like the physical cues that you want to ask a question you know and so sometimes I felt like you are really interrupting the speaker...”

The physical cues are not as clear when teleconferencing, therefore, special attention is needed to focus on inviting comments from each learner. Further, teleconferencing highlighted any lack of coordination. The constant room changes were an issue for the offsite registrars. There needed to be a room dedicated to teleconferencing on the weekly seminars as well as access to a printer and high speed Internet.

“...it would be better if there was a designated room that was one of the huge downsides of it I would get absolutely livid at how we had to change rooms two or three times a day...”

However, the budget did not allow for this and the registrars stated while changing rooms was an issue they understood they were lucky to just be given a room by the hospital.

The seminars were based in the onsite city where majority of the guest speakers were based. Therefore, the guest speakers had often worked with the onsite registrars and facilitators and had already established a rapport. The offsite registrars often felt they were being ignored. This implied it was harder to develop rapport solely via teleconferencing. This also signified the need to better equip the guest speakers with using teleconferencing. The facilitators noted that the incidences when the guest speakers ignored the offsite registrars were the exception and not the rule. Further, role plays were a big part of the Wednesday seminars. In order for teleconferencing to be an effective method of delivering CME to the offsite registrars it has to be able to conduct all aspects of the training. The offsite registrars still managed role plays despite the fact they were teleconferencing, however, the method in which it was conducted had to be altered. The success lied in the facilitator's ability to pay closer attention to the offsite registrars during role plays. Overall, teleconferencing did not affect the onsite registrar's education as their Wednesday seminars remained the same.

Technology

Teleconferencing offered the offsite registrars the flexibility to tailor the Wednesday seminars' to suit their personal situations. However, unlike most other studies the option of travelling for face to face seminars was still viable. The fluidness of teleconferencing and the structure of GPEP-1 sessions meant teleconferencing as an available option when the registrars needed to stay close to home. The overall consensus was there were very few technical problems while teleconferencing. The technology was reliable and successfully connected the offsite registrars to the seminars; however, slight improvements could help improve future use of teleconferencing for the program. There were a few minor issues with the technology that needed fixing and teething problems were viewed as inevitable for the new system, however, teleconferencing fulfilled the basic need of live interactive interaction at a distance.

“...I had no idea how to use it before but we all...yeah we got there in the end...I mean it's great but little things need to be ironed out...”

These findings are inconsistent with Robinson (2002) findings that video conferencing was deemed inconvenient to use due to the amount of organization required for success. For this pilot the teleconferencing technology was solely a method of delivering the information, however, in order for success the method in which it was conducted was crucial (Barker, 2003). Further, McLachlan-Smith and Tracey (2000) found the Internet to be the least favoured method of learning with students preferring videotaped lectures. Video conferencing is a live and interactive video lecture that eliminates distance barriers. The progress in technology over the past decade is substantial and could offer explanation for the difference in opinion of the offsite registrars to the participants in the Robinson (2002) study.

The lag time was the most commonly expressed issue with the teleconferencing seminars. The offsite registrars were unaware there was a lag time and because of this they often felt they were being ignored.

“...sometimes there is that moment of someone talking oh no you’re talking oh no we are talking yeah you know it takes that that second longer for it to come through...”

The offsite registrars felt they were interrupting when they did speak up and the onsite registrars noted the lag time made it more difficult to include the offsite registrars. Further, confidentiality was a concern of the offsite registrars. The registrars noted that the room they teleconferenced in was not sound proof which could be a potential issue. Also there was an emotional distance associated while teleconferencing, however, they never felt disadvantaged and always felt included due to their close group bond and active facilitation. Accessibility to the teleconferencing was a struggle; therefore the PHO is looking at investing, however the benefit has to outweigh the cost. In order for any new system to succeed the facilitators noted it needed to be integrated in every aspect of training in order to normalise the system and allow the facilitators and registrars to become familiarised with the system.

“...success of telehealth and that’s my perception I guess is the overview and stuff that the level of engagement the familiarities in which the system can be used um normalisation of system early on and um I guess developing new process where the system sort of becomes increasingly anchored as part of the culture of the training program...”

Once effectiveness and efficiency is supported then integration to health systems globally is the next logical step (McLaren & Ball, 1995). It is costly to pour money into telehealth projects and spend resources evaluating them and not implementing them. The

technology has proven capable of improving CME for rural health professionals, however, pilot studies are currently as far as most projects progress.

Limitations

This study followed qualitative research methods to acquire data and qualitative analysis of the data. This study aimed to account for the facilitators and registrars experience of the teleconferencing pilot study. Qualitative research was chosen as it is predominantly person centred and humanises a topic (Creswell, 2012). As noted by Braun and Clarke (2006) qualitative data analysis is open to a degree of interpretation by the researcher. Interpretation of the data from the researcher's perspective could potentially impact the data giving a biased account of the registrars and facilitators experience. However, by actively detailing step by step how the data was collected and analysed demonstrates a transparent account of how the results were concluded (Miles & Huberman, 1994). Transparency helps to address the issue of subjective bias. The aim is to make the research as open to the reader as possible in order for the study to be replicated (Mile & Huberman, 1994). Replicating a studies design helps to build reliability of the observed data while identifying observer bias, a characteristic of qualitative data analysis (Braun & Clarke, 2006). Additionally, the simple everyday language used to report the results demonstrates this studies ability to convey a complex topic in a comprehensive manner (Sandelowski & Leeman, 2012). Further, all three of the offsite registrars teleconferencing in the present study were young females and two had children and all mentioned a serious partner. Harris, Novalis-Marine, and Harris (2003) stated the physician demographic most likely to participate in online learning are young females. Further, Wilkinson et al. (2003) stated young males, with a serious, long term partner and young children, were most likely to practice as rural GPs. The demographic included in this study represent the GPs most likely to practice rurally and engage in online learning,

therefore, the results are limited in their scope and ability to represent the wider community of New Zealand GPs. However, the study's main purpose was to examine the experience of the individuals in the pilot study, given that all individuals involved in the pilot study were involved in this study the main purpose was satisfied.

Further, the data was gathered using focus group interviews and as Liamputtong (2009) stated the depth of conversation is limited due to time constraints. It is unfeasible to expect the participants to recall a year's worth of information in less than an hour. The accuracy and depth of their experience has to be taken with a level of caution. Furthermore, it was assumed that all participants were comfortable talking freely with each other and the interviewers, however, due to the close bond that all group members stated for each other certain negative experiences may have been filtered. Further, the general census was that all three focus groups were satisfied with teleconferencing. However, Cobb (2011) warned that overall satisfaction of online learning increases over time. Due the retrospective nature of this study the registrars and facilitators may have left out important experiences early in teleconferencing that could have potentially impacted their overall experience. The purpose of this study was to gain insight into the experience of teleconferencing in order to improve the delivery. The registrars and facilitators were made aware prior to the conclusion of teleconferencing that they were going to be involved in the present study. They all meet with the researcher prior to their focus groups and informally discussed their teleconferencing experience which may have helped to refresh their memory. Additionally, three focus group were conducted each containing three participants. During the interviews information provided by a participants often lead the other participants to recount certain aspects and experiences that they had forgotten, this was true for all participants.

Implications

The major themes that came from the three focus group interviews, offsite registrars, onsite registrars, and facilitators, in level of importance were; group culture, facilitation, teleconferenced education, technology, personal priorities, travel, and rural/remote. The main themes can be separated into two categories; themes that support reasons for switching to teleconferencing and themes that determine the success and failure of teleconferencing. The findings from this study imply that in order for effective teleconferencing to be implemented learners must have no other option but teleconference. This could include; personal priorities, situation, and/or travel distance. If learners are able of attending face to face seminars, as the onsite registrars were, the choice of teleconferencing becomes unnecessary with potential to waste large amounts of money. Further, the guidelines that determine the success or failure of teleconferencing are important to consider prior to implementing the system. In order for a telehealth program to succeed strong group bond between all participants and facilitators needs to be established. Without establishing group culture prior to teleconferencing often risks the distance learners experiencing feelings of isolation.

Further, this study implies that there is a need for teleconferenced education to train rural or remote GP registrars around New Zealand. This study has demonstrated the effectiveness of teleconferencing in terms of, social networking and educational experiences. Distance learners are no longer required to travel to training centres to receive a quality educational experience. With the help of good quality technology and skilled facilitators, highly technical education can be provided at a distance to benefit learners, which for a variety of reasons cannot attend traditional classroom styled seminars.

Recommendations for future research

This study was a comparative study of teleconferencing versus face to face training; however, as Pelayo et al. (2011) noted future research needs to make comparisons between different online learning. The current study has demonstrated the effectiveness of teleconferencing compared with face to face learning, the next step forward would be to conduct a study comparing different year groups' experience with teleconferencing. This would help determine what characteristics generalise to all types of individuals and which characteristics were more specific to this certain group. Long term telehealth projects are seen to produce the best value for money (Whetton, 2005). Further, due to the retrospective nature of this study the results are potentially impacted, however, insight into earlier experiences might have helped to improve the minor issues and negative feelings associated with teleconferencing. Thus, future research could follow the pilot study with focus groups throughout the training to get a more accurate and in-depth account of the learners experience, rather than relying on their ability to recall. Lastly, future research could also explore registrars living in even more remote locations where travel is not an option. This could help determine whether sole teleconferencing is as effective as a hybrid approach, where travel is always an option.

Concluding comments

This study compared teleconferenced educational learning and traditional face to face learning in a group of GP registrars. The results highlighted that learner's personal situation, travel, and geographical location were significant factors contributing to the offsite GP registrars adopting teleconferencing. Further, pre established group culture, active facilitation, and good quality technology were all factors that determined teleconferencing success. These findings provide meaningful guidelines for establishing and maintaining a

successful teleconferenced training seminar. A hybrid approach works best where the option of face to face seminars should always be an accessible training option parallel to teleconferenced seminars (Murphy-Southwick & McBride, 2006).

At the outset it is imperative to establish a need for teleconferencing. In order to justify the cost of teleconferencing the benefits have to outweigh the costs of setting up teleconferencing units (Hailey, 2005). Further, there has to be an issue with the traditional face to face seminars including; the learner's personal situations and the geographical location of the learners relative to the training centre. If all learners live within a few kilometres of the training seminar, face to face seminars should be implemented.

As technology develops, distance learning will become more prevalent in higher education. Further, this study suggested there are certain key components that are required for successful teleconferenced training seminars including;

- Face to face group orientation prior teleconferencing is critical for the development of group culture. Face to face interaction promotes strong group bonding between learners. Additionally, a well established group culture gives learners a sense of community and subsequently reduces feelings of isolation when teleconferencing.
- Employment of a skilled facilitator to ensure active facilitation. The facilitator has the responsibility to ensure all learners are actively included in the seminars. The characteristics that determine a good facilitator for face to face seminars are transferable to teleconferencing seminars. Characteristics facilitators should possess include; active facilitation, active engagement with the learners, an approachable manner, clarity in teaching and organisation.

- Teleconferencing requires organisation. Teleconferencing highlights any disorganisation; therefore, excessively organised teleconferenced seminars produce the best educational experience for learners. This includes;
 - Securing a dedicated and sound proof room for the teleconferenced seminars prior to the start date.
 - Giving guest speakers prior warning that the seminars are teleconferenced so any handouts and resources can be sent to the teleconferencing learners so they are not disadvantaged.
 - Organising in advance when travel is required to the seminars so the overly practical skills can be taught face to face.
 - And access to fast speed wireless internet and a printer while teleconferencing.
- The technology used needs to be the best quality available with little to no lag time. Further, in order for the training program to get the most value for money learners and facilitators should attend a workshop on how to use the technology prior to the teleconferencing seminars.
- Lastly, regular checkups with learners using the technology for educational purposes are required (Catwell & Sheikh, 2009; Sandars, 2011). Checkups ensure learners educational satisfaction while also demonstrating factors that are successful and areas that require further improvement.

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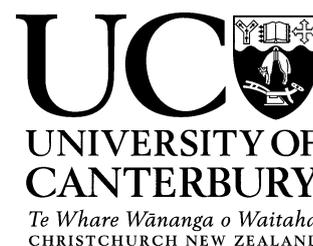
Appendix A

Pheobe Rosandich

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13/12/12



Effectiveness of the Telehealth Training Approach compared with Face to Face Training for Rural General Practitioners Information Sheet for General Practitioner Registrars

I am currently a master's student at the University of Canterbury interested in determining the effectiveness of the distance based education training for the General Practitioner Education Programme (GPEP-1 training programme). The aim of this study is to investigate the advantages/disadvantages of distance based education in terms of social bonding and professional training interaction. This study will also investigate the relative cost and carbon benefits of distance based education.

I would like to invite you to participate in the present study. If you consent to this study you will be required to complete the following:

- Participate in a 60minute focus group interview upon completion of your GPEP-1 training.
- Complete an online Carbon Footprint Calculator to determine the carbon cost of your travel to and from the training seminars.

Your participation in this project is voluntary. If you do participate, you have the right to withdraw from the study at any time without penalty. If you withdraw, I will remove any information relating to you.

Any information or data you provide will be kept confidential. All information and data will be secure and safely store in a locked filing cabinet at the University of Canterbury and in a password protected electronic file. All documents from this study will be kept securely for five years and then destroyed.

The results and findings of this thesis may be used to revise the telehealth training of General Practitioners Registrars. This thesis will be a public document accessible through the University of Canterbury library. All participants can receive a report on this study. All participants are welcome to contact myself (details above), or my supervisors, Assoc Prof Ray Kirk (ray.kirk@canterbury.ac.nz), and Dr Arindam Basu (Arindam.basu@canterbury.ac.nz) at any stage of the study with questions or concerns. This project has received ethical approval from the University of Canterbury Human Ethics Committee. Participants should address any complaints to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

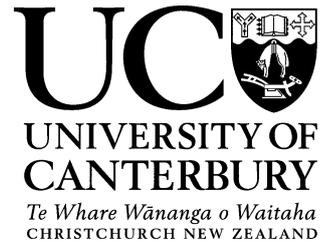
If you agree to participate in this study please fill out the consent form.
Thank you for your time,
Pheobe Rosandich.

Pheobe Rosandich

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Email: pheobe.rosandich@pg.canterbury.ac.nz

13/12/12



**Effectiveness of the Telehealth Training Approach compared with Face to Face
Training for Rural General Practitioners
Information Sheet for General Practitioner Trainers**

I am currently a master's student at the University of Canterbury interested in determining the effectiveness of distance based education training for the General Practitioner Education Programme (GPEP-1 training programme). The aim of this study is to investigate the advantages/disadvantages of distance based education in terms of social bonding and professional training interaction. This study will also investigate the relative cost and carbon benefits of distance based education.

I would like to invite you to participate in the present study. If you consent to this study you will be required to complete the following:

- Participate in a 60minute focus group interview upon completion of training GPEP-1 registrars.

Your participation in this project is voluntary. If you do participate, you have the right to withdraw from the study at any time without penalty. If you withdraw, I will remove any information relating to you.

Any information or data you provide will be kept confidential. All information and data will be secure and safely store in a locked filing cabinet at the University of Canterbury and in a password protected electronic file. All documents from this study will be kept securely for five years and then destroyed.

The results and findings of this thesis may be used to revise the telehealth training of General Practitioner Registrars. This thesis will be a public document accessible through the University of Canterbury library. All participants can receive a report on this study. All participants are welcome to contact myself (details above), or my supervisors, Assoc Prof Ray Kirk (ray.kirk@canterbury.ac.nz), and Dr Arindam Basu (Arindam.basu@canterbury.ac.nz) at any stage of the study with questions or concerns.

This project has received ethical approval from the University of Canterbury Human Ethics Committee. Participants should address any complaints to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If you agree to participate in this study please fill out the consent form.
Thank you for your time,
Pheobe Rosandich.

Appendix B

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13/12/12



Effectiveness of the Telehealth Training Approach compared with Face to Face Training for Rural General Practitioners Consent Form for General Practitioner Registrars

I have received a full explanation of this project and I have been given an opportunity to ask questions.

I understand what is required of me if I agree to take part in this project. That is, I have had a chance to read the Study Information Sheet and have had the opportunity to ask questions.

I understand that my participation in this project is voluntary and I may withdraw at any time without penalty.

I understand that the researcher will keep any information and/or opinions I share confidential and that any published or reported results will not identify me. I understand that this thesis is a public document accessible through the University of Canterbury library.

I understand that any information and data collected during this study will be kept in a secure and locked filing cabinet and/or in a password protected electronic form and will be destroyed after five years.

I understand that I will receive a report on the findings of this study if I request a report. I have provided my email address below for this purpose.

I understand that I can contact Pheobe Rosandich (details above), Assoc Prof Ray Kirk (ray.kirk@canterbury.ac.nz), and Dr Arindam Basu (Arindam.basu@canterbury.ac.nz) for further information.

I understand that I can contact The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz), if I have any complaints or any other questions.

Name: _____

Date: _____

Signature: _____

Email Address: _____

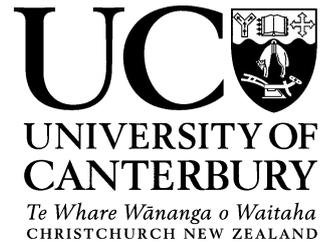
Thank you for your time,
Pheobe Rosandich

Pheobe Rosandich

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13/12/12



**Effectiveness of the Telehealth Training Approach compared with Face to Face
Training for Rural General Practitioners
Consent Form for General Practitioner Trainers**

I have received a full explanation of this project and I have been given an opportunity to ask questions.

I understand what is required of me if I agree to take part in this project. That is, I have had a chance to read the Study Information Sheet and have had the opportunity to ask questions.

I understand that my participation in this project is voluntary and I may withdraw at any time without penalty.

I understand that the researcher will keep any information and/or opinions I share confidential and that any published or reported results will not identify me. I understand that this thesis is a public document accessible through the University of Canterbury library.

I understand that any information and data collected during this study will be kept in a secure and locked filing cabinet and/or in a password protected electronic form and will be destroyed after five years.

I understand that I will receive a report on the findings of this study if I request a report. I have provided my email address below for this purpose.

I understand that I can contact Pheobe Rosandich (details above), Assoc Prof Ray Kirk (ray.kirk@canterbury.ac.nz), and Dr Arindam Basu (Arindam.basu@canterbury.ac.nz) for further information.

I understand that I can contact The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz), if I have any complaints or any other questions.

Name: _____

Date: _____

Signature: _____

Email Address: _____

Thank you for your time,
Pheobe Rosandich

Appendix C

Registrar Focus Group Interview Guide:

The objective of this research is to observe the effectiveness of the telehealth training approach compared with traditional face to face training in the General Practice Education Programme (GPEP-1 training programme). This study will also investigate the advantages/disadvantages of telehealth approach in terms of social networking for trainees and trainers. This study will also investigate the relative benefits of the telehealth approach in terms of carbon accounting.

These questions are to be used as a guide for the focus group interviews. However, there is flexibility for the questions to change depending on the information and responses provided by participants.

Opening Question:

1. Can each of you please tell me how long you have been involved with telehealth and or telecommunication technology for an education purpose?

Does telehealth/ distance based training offer equivalent or improved clinical/educational experiences, compared with traditional face to face training, for GP Registrars in the General Practice Education Programme (GPEP-1 training programme)?

2. How do you feel about the telehealth aspect of the training programme?
3. In your experience with telehealth, what are the key factors required to make it work?
4. What would you change regarding the telehealth programme and why?
5. How do you feel about the education you received in the telehealth training seminars?
6. What is the most significant impact telehealth has had on your learning outcomes?
7. How did the telehealth training enable you to learn the content you needed?
8. Did telehealth make it easy for you to discuss questions with your trainers?
9. How did the content provided via telehealth help you to achieve the GPEP1 learning objectives?
10. How easy was the telehealth videoconferencing to use?
11. How reliable was the telehealth technology being used?
12. Tell me how the telehealth training worked for you as an individual learner/ tell me how it helped you and your learning process?

What are the relative cost benefits, regarding carbon emissions, of telehealth compared with face to face training?

13. What economic value do you associate with telehealth training?
14. How important to you are the carbon savings made due to the telehealth seminars?
15. What are some other benefits for you regarding reduced travel to and from the training seminars?

In terms of social networking, what are the advantages/disadvantages for the GP Registrars using telehealth compared with face to face training?

16. What impact did the telehealth seminars have on your group culture?
17. In terms of isolation, how was your experience with telehealth training?
18. Did the telehealth system make it easy for you to discuss questions with other students?
19. Did the telehealth learning system make it easy for you to access and share content with other registrars and trainers?
20. Would you recommend this telehealth training system to other rural GP registrars and why?
21. What is needed to make telehealth more appealing to GPs?
22. How important to you was the face to face interaction with trainers and other registrars in the seminars?
23. How competent do you feel the Telehealth training provided sufficient cultural considerations?

Closing Question:

24. As a whole, how did you find the telehealth conferencing seminars?
25. Is there anything specific you wish to add or emphasize before we end?

Appendix D

Facilitators Focus Group Interview Guide:

Opening Question:

1. Can please tell me how long you have been involved with telehealth/telecommunication technology?

Does telehealth/ distance based training offer equivalent or improved clinical/educational experiences, compared with traditional face to face training, for GP Registrars in the General Practice Education Programme (GPEP-1 training programme)?

2. How do you feel about the telehealth aspect of the training programme?
3. In your experience with telehealth, what are the key factors required to make it work?
4. What would you change regarding the telehealth programme and why?
5. How do you feel about the education you provided in the telehealth training seminars?
6. How did the telehealth training enable you to teach the content you needed?
7. How easy was the telehealth videoconferencing to use?
8. How reliable was the telehealth technology being used?

What are the relative cost benefits, regarding carbon emissions, of telehealth compared with face to face training?

9. What economic value do you associate with telehealth training?
10. What are some other benefits for you regarding reduced travel to and from the training seminars?

In terms of social networking, what are the advantages/disadvantages for the GP Registrars using telehealth compared with face to face training?

11. What impact did the telehealth seminars have on the group culture?
12. What is needed to make telehealth more appealing?
13. How important to you was the face to face interaction with the registrars?

Closing Question:

14. As a whole, how did you find the telehealth conferencing seminars?
15. Is there anything specific you wish to add or emphasize before we end?