

# Attitudes Toward Information and Communication Technology (ICT) in Residential Aged Care in Western Australia

Poh-Kooi Loh, FRACP, Leon Flicker, FRACP, PhD, and Barbara Horner, PhD

**Objectives:** Determine why introduction of health consulting services via Telehealth video conference consultations failed in residential aged care facilities (RACF).

**Design:** Semistructured interview groups and quantitative survey.

**Setting:** Two participating not-for-profit RACF.

**Participants:** Managers, employed carers, physiotherapist, occupational therapist, registered nurses, and residents from RACF.

**Measurements:** A survey initially followed by focus groups that centered on 4 questions. How can computers help improve care? What kind of electronic services and products could help improve care? Who should have access to the technology and why was the technology not used?

**Results:** The survey revealed there was awareness of information and communication technology (ICT) in RACF. However, respondents were uncertain of potential benefits provided to their clients. Only 43% of respondents thought a minority of clients

would receive the benefits of ICT use. The focus groups revealed several themes regarding the attitudes toward ICT in RACF. Positive attitudes to ICT included themes of saving time, easier doctor access, cost saving, and improved communications. Negative attitudes included themes of loss of human contact, inadequate training, security barriers, not user friendly, limited ability to comply with suggestions, privacy issues, and capital cost. Residents were also concerned about confidentiality and loss of human interaction with the use of Telehealth in residential aged facilities.

**Conclusions:** More training for staff is required to enable them to use ICT efficiently. ICT hardware and software at the user interface must be designed to maintain confidentiality with ease of access. Access to Telehealth services should not impede the routine delivery of personal care and human contact for residents. Studies are required as to where human input to residents is unable to be replaced by Telehealth services. (*J Am Med Dir Assoc* 2009; 10: 408–413)

**Keywords:** Information and communication technology; residential aged care facility; technology acceptance; qualitative study; survey

Permanent residential aged care in Australia provides care and support services to older people who are no longer able to care for themselves in the community. The Australian government provides funding in the form of subsidized daily

care fees for residents who require financial assistance and residents with special care needs in accredited aged care facilities.<sup>1</sup> Funding is provided for either high-level (nursing home) or low-level assisted care (hostels) need as determined by a comprehensive assessment. Nursing homes provide 24-hour total care without on-site medical staff, whereas hostels provide hotel services and some personal care with limited supervision. In Australia there is some evidence that residents in aged care facilities are poorly serviced in both primary and specialist medical care, even though residents are the sickest and most frail of the aged population in Australia.<sup>2–4</sup>

Routine medical services in residential aged care facilities (RACF) are provided by general practitioners (GPs). It is becoming increasingly difficult to attract GPs to RACF. In

---

WA Center for Health and Ageing, Department of Geriatric Medicine, Royal Perth Hospital, Perth, Western Australia (P.K.L., L.F.); Center for Research on Aging, Curtin University, Perth, Western Australia (B.H.).

The author have no conflicts of interest.

Address correspondence to Poh-Kooi Loh, FRACP, WA Center for Health and Ageing, Department of Geriatric Medicine, Royal Perth Hospital, Wellington Street, Perth, Western Australia 6000. E-mail: Poh-Kooi.Loh@health.wa.gov.au

Copyright ©2009 American Medical Directors Association

DOI:10.1016/j.jamda.2009.02.012

a study conducted by GPs interested in aged care, Bertinshaw<sup>5</sup> reported that the reasons for hospital transfers were thought to be related to lack of access to primary medical services, staff numbers or level of clinical skills, coordination of primary medical care, and protocols to support decision making within the RACF environment. Unfortunately, emergency department (ED) transfer becomes one of the few methods whereby residents can access specialist care. Developing a system to provide timely advice by video conference with health professionals, access to data for clinical decision making, and improving communication between care providers to RACF is possible with information and communication technology (ICT).

ICT can provide knowledge and clinical support to care staff and better access to facilitate decision-making information for RACF health care providers. The Commonwealth Department of Health and Aging has noted the potential of ICT to achieve these aims.<sup>6</sup> Similar observations about ICT in health have been noted in the United Kingdom, United States, Hong Kong, Australia, and Canada.<sup>7-11</sup>

The feasibility of ICT in residential care in Australia had been questioned previously. However, a study by Yu<sup>12</sup> combined quantitative and qualitative research methods and found good potential and preparedness for ICT in residential care facilities.

In 2005, it was hypothesized that ICT would reengineer workflow, and minimize medical access block and transfer of residents from RACF to overcrowded hospitals. A trial using Telehealth video conferencing to provide health advice to facilities compared to routine care as the control was commenced with all residents in those facilities as potential subjects. Health care of the residents was to be improved by offering video conferencing by a specialist medical practitioner or health professional situated at a hospital some distance away. In addition residential care staff and their attending GPs were to be offered this video conferencing consultative service. GPs attending the RACF were invited to send referrals for RACF residents, who required medical advice, which were received by the investigator. A video conference was then arranged for the GP and resident from the RACF to a specialist geriatric medicine practitioner located at the Telehealth studio at a metropolitan teaching hospital. Family and RACF staff were invited to be present. The interventions included access to timely clinical information such as medications and care plans. The investigators also provided video conferencing equipment if it was required by the RACF. Unfortunately, video conferencing occurred with only 1 subject after 3 months. Although there were many GP referrals, GPs were contacted but they were unable to schedule appointments for teleconferencing at the facility after multiple reminders. Residential care staff also found it difficult to attend. Because of the poor uptake of the intervention trial it was decided to perform this study in 2 phases, survey and focus groups, to determine why this was the case.

## METHODOLOGY

A mixed methodology was chosen for this study obtaining both quantitative and qualitative data. A survey was initially

used to elicit prespecified responses to questions exploring variables that could have contributed to the low uptake of Telehealth in residential aged care facilities. However, it became apparent during analysis of the survey data that there were additional views that were not being revealed by the survey. Focus groups using semistructured questions were more appropriate as there was a need to explore the multiple causes for this problem and to determine personal views of the staff and residents. It would allow the researcher to probe for other possible factors. It would allow further generation of hypotheses and greater determination of themes and social frameworks involved.<sup>13</sup>

## DATA COLLECTION

### Phase I: Survey

The survey was conducted in May 2005. The questionnaire was developed loosely based on the Australian Medical Practitioner E-Health and computer use studies<sup>14,15</sup> and trialed with an Aged Care Assessment Team (ACAT). The questionnaire drew upon concepts pertaining to the areas of practice computerization, E-mail usage, Internet usage, Internet applications, patient education, and doctor education. The ICT Aged Care survey was then piloted with ACAT staff and modifications made. The questionnaire was then distributed by the ICT department of a large not-for-profit nursing home group to all 160 employed care staff.

### Phase II: Focus Groups

The 4 focus groups occurred in 3 facilities. Two focus groups occurred in the hostel. The hostel consisted of 6 independent dwellings. There were 2 computers on the premises, one in a care manager's office that has access to the Internet. The other in an administrative assistant's office that was also used by the occupational therapists and physiotherapists if required. The facility does not have broadband. Previously one resident had a computer but no residents had a personal computer at the time of study.

The staff and residents of the hostel attended different focus groups, 3 months apart. The hostel had 50 residents who were invited to attend. This was on a voluntary basis and there were no incentives provided to attend. Seventeen residents were present (12 women and 5 men) at their focus group; no relatives were present. Two carers were in attendance in case assistance was needed by the residents. A nurse with a loud familiar voice and known by the residents assisted by repeating what the researchers said.

One focus group, which involved only staff, occurred at a nursing home that offered residential care for 62 people, 58 single, and 2 double rooms with 1 bed allocated for respite residents. This complex consisted of 4 dwellings. One dwelling housed mainly younger men and another solely housed people with dementia. There were 4 computers on the premises: in the deputy care manager's office, in the administrative assistant's office, in the care manager's office and one for the nurses, which was also used by the allied health professionals. The facility did not have broadband but had an internal network with RACF from the same organization

in Perth. Access to the internal network and E-mail were restricted, password protected, and available only upon request. There was a fifth computer with “BigKeysLX” for residents’ use in one of the dining areas. A volunteer assisted 3 residents to use it for card games (Solitaire) or typing. One resident had a computer but no Internet access. On site there were registered nurses, enrolled nurses, personal care assistants, and allied health professionals. Several general practitioners visited the residents and provide on call assistance.

The fourth focus group, which also involved only staff members occurred at a combined hostel and nursing home facility whose patients predominantly have dementia. At this facility there were 92 nursing home places and 153 hostel places in 3 dwellings, including an 11-place dementia-specific wing. There were 3 computers in the 7 high care facilities. E-mail and Internet access was password protected and limited to staff only. None of the residents had a computer.

Flyers were sent to the manager of the facilities and posted in the staff room, offices, and common rooms for residents. The time for the focus group was chosen to accommodate shift change and maximize attendance. Maximum variation sampling of staff in RACF was attempted by inviting all staff working within each RACF to attend the focus groups. Verbal consent was obtained from volunteer participants and staff were informed that all responses were confidential and only for research purposes. The focus groups were conducted in large rooms at the facility concerned. Three of the focus groups involved staff in those facilities, and the fourth focus group comprised residents from the facility. In total, the 4 focus groups conducted involved: 8 staff working in a hostel; 15 staff from a combined hostel and nursing home; 9 staff from a nursing home; and 12 residents living in a hostel. Flexibility with respondents involved in the focus group was especially important and staff known to the residents were available to mediate discussion with older people who were not familiar with the focus group process and its demands.

The focus groups lasted 60 to 90 minutes. They were recorded with the consent of the participants. The audiotapes were then transcribed and analyzed after each focus group. The investigator and a research assistant with experience in qualitative studies facilitated the 4 focus groups in RACF. A set of 4 general questions was initially asked to stimulate discussion. These were:

1. How can computers help improve care in your facility?
2. Do you know what kind of electronic services and products could help improve care in your facility?
3. Who should have access to the use of the technology?
4. Why wouldn’t you use this technology?

Passive observation was achieved during the focus group by the noninteracting researcher and notes of these observations were made. The researcher conducting the focus groups took turns in performing observations.<sup>16</sup>

Focus groups were ceased when analysis and review of observer notes after each focus group determined saturation of the data.

## ANALYSIS

### Survey

Data from the surveys were entered and analysis of descriptive statistics using Microsoft Excel (Microsoft Corporation, Redmond, WA).

### Focus Groups

Inter-rater reliability of data analysis involved the research assistant and the researcher assessing each other’s individually documented personal observations, and analysis of the recorded focus group. All audiotapes were transcribed verbatim using Nuance Dragon Naturally Speaking software version 8 (Dragon Naturally Speaking, Version 8, Burlington, MA) directly into rich text format in a computer. The transcribed text was examined by one researcher initially and then examined by the second researcher. Two researchers reviewed the transcripts independently to ensure inter-rater reliability and to confirm meaning and understanding. The transcripts were analyzed using Xsight 2 software (QSR International, Pty Ltd., Doncaster, Victoria, Australia) to organize and assist with the process of distillation of this large body of information. The study resulted in a large quantity of predominantly qualitative data from the focus groups and notes from researchers’ observations.

Within the context of the research process, the researchers engaged in a cooperative process of data analysis. This process was based on the work of Denzin<sup>17</sup> and is described as interpretive analysis, where the researcher seeks to identify “epiphanies,” or illuminating experiences, to reveal meaning.<sup>18</sup> Analysis of the study material revealed the most significant experiences the respondent(s) had revealed in relation to the issues raised during the focus groups. Information was verbal and behavioral. Significance was apparent only after study and inductive reasoning. The action of unbundling transcripts into epiphanies or significant responses was supported by the use of software programs including Xsight. By systematically classifying the narratives, epiphanies, and dialogues using the software the significance of the data was better understood.

The process of analysis was in stages. Researchers looked for individual comments and/or illuminating experiences that revealed an individual response or participants’ experience. These comments were then further explored to identify common comments and/or illuminating experiences, sometimes described as an epiphany. Grouping of common responses and experiences revealed themes that were repeated throughout the data. Themes were then defined with examples or elements of the data, supported by examples and/or epiphanies. During the analysis of data, every effort was made to incorporate the language of the participants to illustrate themes and elements. Themes were then categorized as positive or negative attitudes toward ICT.

The findings of the study are summarized in Figure 1, which maps the positive and negative attitudes provided by the RACF staff and residents.

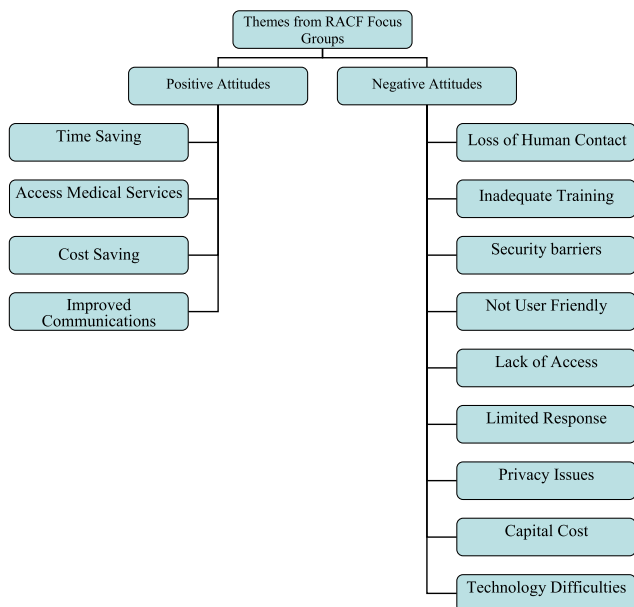


Fig. 1. Results of focus groups.

## RESULTS

### Results from the Survey

There were 53 questionnaires returned from the nursing home group, yielding a response rate of 33%. This included 13 nurses, 16 carers, 3 medical practitioners, 7 allied health professionals, 7 facility managers, and 7 other related RACF staff (see Table 1).

In general, the survey revealed that most respondents used computers at work (60%) However, most respondents did not see the value of ICT in sourcing the Internet for information while at work, nor as a method for saving time. Most of the respondents thought that ICT would benefit less than 10% of residents at their facility. Twenty-two percent thought there would be no benefit to the residents in their organization and 24% did not know if there would be any benefit. Twenty-eight percent of respondents did not realize that electronic records were kept at the facility.

### Results from Focus Groups

The process of data analysis has been described previously. A total of 13 themes were identified, 4 categorized as positive attitudes and 9 categorized as negative attitudes (see Figure 1). The positive attitudes to ICT included saving time, ease of access to doctor, cost saving, and improved communications. The negative attitudes included loss of human contact, inadequate training, security barriers, not user friendly, perceived technical difficulties, limited response, privacy issues, and capital cost.

#### Theme: Positive Attitudes

The theme of positive attitude illustrated awareness of ICT and its utility in residential aged care. Two of the managers of the hostels said that they saved time in their daily administrative duties. The need for having access to medical services on site was confirmed by a manager who stated the advantage of

Table 1. Survey Question Responses

	Percentage Response %
Frequency Telephone Conferencing Use by Respondents	
Never teleconference	66%
Daily teleconference	8%
Teleconference several times/wk	2%
Teleconference once/month	18%
Frequency of Computer Use at Work	
Daily computer use	40%
Computer use several times/week	20%
Never use Computers at work	40%
Awareness of Electronic Record Keeping At RACF	
Aware that only hard copies of records are available	30%
Aware that hard and electronic copies of records are available with total duplication of data	8%
Aware hard and electronic copies available with no duplication of data	11%
Don't know	28%
Internet Use at Work	
I use the Internet at work	18%
I am aware that the care manager uses the Internet at work	41%
I am aware that nurses and allied health staff use the Internet at work	35%
I am aware that carers use the Internet at work	0%
I am aware that medical staff use the Internet at work	3%
Web sites Referred to Clients by RACF Staff	
I refer any useful sites to clients	4%
I only refer general health or disease-specific Web sites	16%
I have not referred any information Web sites to clients	71%
Education Medium Preferred by Staff at RACF	
I prefer education by video conferencing	14%
I prefer educational resources from Internet Web sites or online journals	41%
I prefer education from video tapes or DVDs	32%
Perception of Time Saved With ICT	
No time saved with ICT use	30%
I perceive less than 30 minutes per work day saved by ICT use	17%
I perceive 31 to 120 minutes per work day saved by ICT use	13%
Don't know if time is saved by ICT use	40%
Computer Software Work Tools used by RACF Staff at Work	
Calendar on the computer	74%
E-mail	45%
Word processor on the computer	47%
Spreadsheet on the computer	43%
Presentation software on the computer	15%
Data manager on the computer	2%
Do not use any software computer tools at work	11%
Perception of the Number of clients benefiting from ICT	
I believe no clients benefit from ICT	22%
I believe fewer than 100 to 1000 clients per annum benefit from ICT	54%
Don't know if clients benefit from ICT	24%

ICT, information and communication technology.

caring for residents on site. Residents also felt the advantage of being able to stay at the RACF and get access to medical care in their home. Some assistants were able to foresee that a range of conditions would be amenable to video conferencing assessment and furthermore it would aid multidisciplinary communication. One assistant found that ICT allowed her to improve communication between different facilities of the same organization. A nurse also supported the ease of communication when transferring patients.

The participant researcher made an observation at a hostel that there was general consensus the electronic resident notes (medical records, drug charts, progress notes, care plans) may help when residents were transferred to a different facility or to hospital. This meant that paper copies of progress notes and care plans did not need to accompany the patient. Unfortunately, software differences did not allow different facilities to share their care plans. This was reinforced by several of the respondents.

### ***Theme: Negative Attitudes***

The need for human contact and a warm relationship appeared paramount to the residents. This was simply and forcefully expressed by a resident who said simply: "We are not robots here." More importantly the residents were "one voice" and in consensus about human contact. This is demonstrated by a dialogue with the participant researcher who started by saying, "If your doctor could not come and see you would you be happy to see him on the television screen? He would be at the surgery, and you would see him through the television." The residents from the RACF in a unified chorus replied together: "No, no." This was further reinforced by a resident who stood and said "I wouldn't be happy about it." There was also an assistant who also felt strongly about the need for human contact with older people. Another stated this by saying, "when you are old you would like someone to actually talk to you. They like us all to come in to say hi, how are you. They really love me and human contact, face-to-face." A manager was also concerned about the potential invasion of privacy by video monitoring.

There was a perception that more training was required. A manager emphasized this and the resources required for ongoing training. Access to ICT was protected by password and security procedures were sometimes seen as a barrier to work flows. Furthermore, if these measures were elaborate, they could be a barrier to communication. There was a perception that not all aged care workers in RACF were able to use ICT. This comment implied that routine access to ICT was not considered necessary by management of the organization and possibly a nuisance to provide ICT access to personal care assistants, and that it would detract from their real work. There were also assistants who were quite technologically adept and were finding it difficult to access ICT. Among some assistants there was concern that some aspects of ICT were not user friendly and wasted time. The access of health advice via telephone was time consuming.

The number of available computers also contributed to the problem with the software being perceived as not user

friendly. There was a concern from an assistant that they had limited ability to respond to advice provided by health professionals via ICT such as Telehealth video conferencing. One assistant felt that her response to ICT advice was limited legally, as most carers are not enrolled or registered nurses. They cannot legally provide nursing or medical interventions. Another concern on the theme of limited response was there was the lack of qualifications that would allow them to act during a medical emergency other than to call for help and send the resident to hospital. There was a major concern by nursing staff at a hostel that the use of video conferencing could be open to abuse. The doctor who was called after hours does not know the patient as well as the regular attending doctor. During the after hours, video conference staff may order sedation to minimize disturbance during their shift to the detriment of the health of the patient.

There were questions about the funding that was available to provide the infrastructure for services and training required to provide ICT in RACF. There was an implication that the funding of ICT in RACF should not be left to the RACF alone and should involve government and nongovernment agencies. Technical difficulties increased the time required to use the technology and the apprehension of the RACF staff with ICT.

## **DISCUSSION**

The focus groups revealed several themes on ICT in RACF. Positive themes on ICT included themes of saving time, easier doctor access, cost saving, and improved communications. Negative ICT themes were loss of human contact, inadequate user training, unnecessary security barriers, not user friendly, limited ability to comply with user suggestions, privacy issues, and capital cost. Residents were also concerned about confidentiality and loss of human interaction with the use of Telehealth in residential aged facilities.

The survey has shown that there was some awareness of ICT in RACF. However, in general, respondents were uncertain of potential usefulness provided to their clients. Almost half (43%) of respondents thought only a small percentage of clients would receive the benefits of ICT use. This would partly explain the low uptake of consulting services by Telehealth video conferencing offered in the trial immediately before this study. Furthermore, the Aged Care Residents' perceptions of ICT were almost universally negative. Residents did not generally use computers or access the Internet. They were against video monitoring in rooms because of confidentiality issues. Residents in this study were concerned about the loss of human personal contact as a result of the introduction of ICT. They felt that having a video camera in the room was an invasion of privacy. Residents preferred not to use video conferencing for medical assessments. Most residents were not familiar with this technology and had to have it explained to them during the focus group.

Yu<sup>12</sup> conducted a quantitative and qualitative study of ICT looking at the computer skill sets and attitudes of RACF workers in utilizing information systems to manage care in another region of Australia. This study looked at the willingness

of aged care workers to use information systems and was conducted after there was a similarly low uptake of Telehealth video conferencing for aged care services to RACF. More of the respondents were younger, used computers, were more exposed to the use of the Internet at work, and supported the use of information systems for data sharing. However, 17% disagreed with information sharing, 48% felt that they should receive adequate training such as word processing and typing before embarking on an electronic documentation. Despite their generally favorable responses to the use of ICT, there was still very poor uptake. Some of the responses in these studies seem to be consistent in that the use of ICT is being received cautiously by the aged care industry in residential aged care facilities in Australia.

To overcome these negative attitudes, each negative perception needs to be addressed. According to the Norwegian Board of Technology, substantial staff training, both initial and ongoing, is required to enable staff to use ICT efficiently and competently. More resources are also required at the user interface for ICT hardware and software to maintain confidentiality while allowing ease of access.<sup>19</sup> The technology acceptance model (TAM) is adapted from the Theory of Reasoned Action (TRA) to explain the adoption of new technology. TAM is based on the construct that perceived usefulness and perceived ease of use determine the individual's intention to use a system or process such as Telehealth video conferencing in ICT.<sup>20–22</sup> Perceived usefulness is influenced by perceived ease of use, which was limited in the RACF scenarios studied and supported by the present survey results.

The residents need to be more comfortable with ICT so that they do not feel the human warmth of caregiving has been removed by this modality. To do this requires a careful study of where human input is indispensable and when it can be substituted without affecting the human-to-human interface. According to the American Institute of Physics, the privacy or confidentiality issues with ICT in aged care have been raised by seniors.<sup>23</sup> This has been resolved by allowing residents to choose who monitors their activities via ICT. The level of monitoring can also be determined by the resident. For example, the resident can choose to have only motion detectors to monitor movement but no video or audio monitoring. A proposal for future studies would be to map the process of personal care delivery in residential aged care facilities before introduction of Telehealth services. This would determine work flows so that Telehealth video consulting is not seen as a hindrance to daily personal care routines for the resident. Access to Telehealth services needs to be designed so they do not impede the day-to-day routines within the aged care facility such as meal services, showering, and house cleaning services. If Telehealth and ICT are to benefit staff and residents, they require the staff to have full involvement and ownership. A program seeking involvement from the stakeholders and change management would suit an action research study on how to accommodate Telehealth consulting services within the complex array of personal care services delivered in RACF.

## REFERENCES

1. Australian Institute of Health and Welfare (AIHW). Australia's Welfare 2007. AIHW, Canberra. ACT. Available at <http://www.aihw.gov.au/publications/index.cfm/title/10527>. Accessed January 5, 2008.
2. Flicker L. Health care for older people in residential care—who cares? *Medical Journal of Australia* 2000;173:77–79.
3. Gray L. Two-year review of aged care reforms. Canberra, ACT, Australia: Department of Health and Aged Care 2001.
4. Scherer S. Position Statement 9 from Australian and New Zealand Society for Geriatric Medicine: Medical Care for People in Residential Aged Care Facilities. 2001. Available at: <http://www.asgm.org.au/posstate.asp>. Accessed April 6, 2008.
5. Bertinshaw N. Needs and gap analysis of GP after hours availability to aged residents 70+ in supported accommodation in South East Metropolitan Perth. Final Report for the Canning Division of General Practice. Western Australia: Cannington; 2003.
6. Commonwealth Department of Health and Aging. Clinical IT in Aged Care. Interim Report July 2003. Home page of the Australian Department of Health and Aging. Available: <http://www.ageing.health.gov.au/rescare/clinitrep.htm>. Accessed November 6, 2004.
7. Department of Health United Kingdom. 2004. NHS to be first major public sector user of broadband. NHS National Programme for Information Technology. Press release. Available at: <http://www.dh.gov.uk/assetRoot/04/07/40/64/04074064.pdf>. Accessed January 9, 2008.
8. Edwards MA, Patel AC. Telemedicine in the State of Maine: A model for growth driven by rural needs. *Telemedicine Journal and e-Health* 2003;9:25–39.
9. Hui E, Woo J. Telehealth for older patients: the Hong Kong experience. *Journal of Telemedicine and Telecare* 2002;8:39–41.
10. Yu P, Yu H. Challenges to the adoption of mobile and wireless technology in Australian aged care. *Journal of Telemedicine and Telecare* 2004;10:105.
11. Jadad AR. A view from the Internet age: Let's build a health system that meets the needs of the next generation. *JAMC* 2004;171:1457–1458.
12. Yu P. Research summary: Capacity and willingness of residential aged care workers to use IT to manage care information. *Geriatrics* 2005; 23:22–23.
13. Green J, Britten N. Qualitative research and evidence based medicine. *BMJ* 1998;316:1230–1232.
14. ACNielsen. ACNielsen Consult Online Health Study. 2004. Available at [http://www2.acnielsen.com/news/20040309\\_ap2.shtml](http://www2.acnielsen.com/news/20040309_ap2.shtml). Accessed June 16, 2008.
15. Henderson J, Britt H, Miller G. 2006. Extent and utilisation of computerisation in Australian general practice. *MJA* 2006;185:84–87.
16. Greenhalgh T, Taylor R. How to read a paper: Papers that go beyond numbers (qualitative research). *BMJ* 1997;315:740.
17. Denzin NK. *The Research Act*. 3rd ed. Englewood Cliffs, NJ: Prentice Hall; 1989. pp. 102–120.
18. Stringer E, Genat W. *Action Research in Health*. Upper Saddle River, NJ: Pearson Prentice Hall; 2004.
19. Norwegian Board of Technology. ICT for elderly people: Final report from the consensus conference of The Norwegian Board of Technology. 2000. Available at: [http://www.teknologiradet.no/ICT%20for%20elderly%20people\\_wNGky.pdf](http://www.teknologiradet.no/ICT%20for%20elderly%20people_wNGky.pdf). Accessed May 27, 2008.
20. Davis FD. A technology acceptance model for empirically testing new end-user information systems: Theory and results [dissertation]. Cambridge MA: Sloan School of Management, Cambridge, MA: Massachusetts Institute of Technology; 1986.
21. Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly* 1989;13:319–339.
22. Davis FD, Bagozzi RP, Warshaw PR. User acceptance of computer technology: A comparison of two theoretical models. *Management Science* 1989;35:982–1003.
23. American Institute of Physics. Digital Grandparents: Computer Scientists Create New Technology For Elderly Home Owners. *Discoveries and Breakthroughs Inside Science(DBIS)*. Nov 11, 2007 Edition. Available at <http://www.aip.org/dbis/stories/2007/17129.html>. Accessed May 28, 2008.