

► Telenursing for the elderly. The case for care via video-telephony

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Summary

As most elderly people prefer home care to residential care, the nursing profession must change its current practice. New models of care are necessary. Information and communications technologies, such as video-telephony (i.e. any form of face-to-face video-communication), allow elderly people to maintain their autonomy by strengthening their emotional, relational and social abilities. Experiments in a variety of settings have tested a range of interventions based on video-telephony, from the simple giving of information to the provision of therapeutic procedures. The elderly have appreciated the opportunity to use video-telephony to communicate with a nurse about their needs, expectations and feelings. After some initial scepticism, nurses have concluded that telenursing complements traditional nursing practice. Although technology is no panacea for the problems of ageing, when applied judiciously it can bolster the position of vulnerable ageing citizens.

Introduction

Society demands that health-care costs be controlled while quality and access to care are maintained. Elderly people are disproportionately heavy consumers of social and health services, especially nursing care, although the interventions they typically require primarily consist of professional procedures for a specific problem for a limited period. Many needs and expectations¹ of the elderly in relation to their autonomy are unfulfilled:

- (1) the need for physiological and physical safety may not be met because of the physical dependency older people often experience;
- (2) behavioural and emotional security is threatened by mental deterioration;
- (3) the need to feel a sense of belonging is often countered by the social isolation of the elderly, as is their need for friendship, affection and love.

Proper management of these needs improves the autonomy of the elderly and may reduce their requirements for acute, expensive care.

Accepted 7 July 2001

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Could telenursing be of benefit to the elderly? So far, the diffusion of telecare services has been slow in Europe, with the exception of social alarm systems. Health policy makers and professionals at different levels of the health system have not generally recognized the strategic significance of information and communication technologies such as video-telephony (i.e. any form of face-to-face video-communication). This paper discusses the prospects of providing telenursing care for the elderly via video-telephony.

Care and nursing care

The term 'care' here covers all the interventions used to promote, restore or sustain the autonomy of individuals. Nursing care used to be associated only with giving injections, dressing wounds and other bedside procedures and treatments prescribed by doctors (the 'instrumental' procedures)². However, Orem³ identified five more types of nursing intervention:

- (1) advising;
- (2) giving physical support;
- (3) giving psychological support;
- (4) creating an environment to promote personal growth;
- (5) providing instruction or education.

Clearly, these information and communication components of nursing are as important as the instrumental techniques.

Proot *et al.*⁴ suggested that Orem's definition of self-care³ was centred on the concept of individual autonomy. Thus people who are physically extremely dependent, and require a great deal of hands-on care, can be autonomous as long as they can take their own daily decisions and can rely on support. 'Support' here can be viewed as 'care without hands'. It becomes an intervention when it is offered by a caring organization within some formal arrangement.

As most elderly people prefer home care to institutional care (typically in a residential or nursing home), the nursing profession must change its practice. New care models are necessary to inform and educate the elderly, and to promote their autonomy at home. Continuity of care is a long-term obligation, and seamless care requires the integration of social welfare and health-care services. This requires operational data to be recorded on interventions (type, timing, volume, quality and cost) and on client status (demographic information, intervention outcome, and an assessment of needs and expectations). The management of the knowledge derived from these data is a challenge for home care.

In the coming decades, technology-supported care will probably increase and this will require care professionals to learn appropriate skills. Any technological innovation, whether home dialysis, disposable nappies or new pharmaceutical drugs, offers new opportunities for nursing, but also challenges the caring ethos of the nursing profession. The diffusion of new technology depends on the perceptions of it, principally in terms of improved care, on the part of both clients and carers. Hence, progress will depend on an alignment between the technology and nursing practice.

Technology and the elderly

Technological devices have become common in the private and professional lives of many people. Many elderly people are not technophobes⁵, although they will often express feelings of being 'left behind' by technology. Barriers do exist, such as lack of skills, unintelligible instructions or manuals, lack of financial means, the socio-economic situation, limited educational backgrounds, physical frailty, language problems, personal attitudes, gender issues and social stigma. Nonetheless, all elderly people are familiar with the telephone and the television, which are information and communication technologies. Moreover, some

elderly people already use PCs and the Internet to obtain information and for email.

Our understanding of why some elderly people use or reject new technology is imperfect⁶. Sing *et al.* stated that the main reason for the elderly not adopting technology is that they do not see it as important in meeting their needs⁷. Gilly and Zeithaml⁸ reported that elderly people readily accept technology when it does meet their needs. In particular, those elderly people with unsatisfactory contact with others are more receptive to technology⁹. Furlong stressed that technology will be useful to the elderly only if it empowers them¹⁰. It has been found that networks of senior citizens can enhance their feelings of physical safety and emotional security: 'If I am unable to sleep at night, all I have to do is go to my computer and there is always someone to talk to, laugh with, exchange ideas'¹¹. Billipp reported that interactive computer use, associated with weekly nurse computer training, significantly improved self-esteem and depression in a population of vulnerable elderly people¹².

As older adults are more receptive to modern technology than was previously assumed¹³, manufacturers have become interested in this group of potential users when designing technology. As technology develops, some believe that unequal access to technology will widen the gap between the technology rich and the technology poor. User-friendliness is one way of bridging this gap. Hence, it is important to involve the elderly in the development of new technology¹⁴. The increasing number of elderly people, their improved education and lifestyles, their increased prosperity and their enhanced self-esteem represent a new market for technologies that are geared towards their needs. As needs generally increase with age, we suggest that the very start of the elderly phase of life is the right time at which to introduce new technologies.

Telenursing

Telenursing care is an umbrella term for nursing interventions at a distance. In other words, it is a technique, not a technology. Visits to or from the nurse have their drawbacks. In addition to the practical problems of transport, the on-site nurse is likely to have only a thumbnail assessment of the patient's status and functioning. For example, the visit will probably not allow monitoring of the patient's response to, and compliance with, medications or other treatments. Telenursing should save travel time and costs, make nursing care more readily available¹⁵, improve compliance with therapy¹⁶ and prevent, delay

or limit admissions to nursing homes, unscheduled visits to a doctor and hospital admissions¹⁷.

Experience shows that the elderly do not feel that telenursing offers them a substandard form of care, but find the approach very warm¹⁸. Schlachta¹⁹ emphasized that the elderly will not object to telenursing if it ensures them access to the care that they need.

Some believe that the behaviour of the elderly depends on the nurses' attitude²⁰, but nurses tend to be more sceptical about telenursing care than patients. Their criticism is that 'the essence of nursing is contact and engagement with people, which involves physical closeness, intimacy, and interpersonal sharing and caring that cannot be approached with computer technology'²¹. Nurses are anxious that telenursing will lead to a dehumanization of care²², a decrease in the quality of nursing care²³ and the loss of jobs²⁴. They raise concerns about privacy, confidentiality and security of sensitive patient information²⁵.

Conversely, other authors argue that nursing should be in the forefront of new ways of delivering care²⁶. Telenursing care is not a professional specialty. It offers a new care model to facilitate and complement traditional nursing practice. A combination of on-site and tele-interventions allows nurses to provide care more efficiently and makes the patients active partners in the management of their own health-care. The travel time saved may actually increase the frequency of patient interventions, hence strengthening self-care. Once nurses are aware of the strengths and weaknesses of telenursing, they can begin to determine how it will be applied to a given population, based on the patients' characteristics, their needs and expectations.

Unfortunately, there is no evidence regarding what kind of patients¹⁵ will benefit most from which type of telenursing, and what kind of nurses respond well to delivering care by telenursing. Further studies are required.

Care delivery using video-telephony

People communicate by signs as well as sounds. Videoconferencing has the advantage of adding video to audio communication. Studies of interactive video have used a variety of telecommunications media, including cable television and digital networks such as ISDN. In some studies, video signals of acceptable quality have been transmitted via ordinary telephone lines. The ability to see facial expressions and other body language, and to see important objects at the remote site, is of particular benefit when communicating about needs, feelings, expectations and motives.

A wide range of technology has been used in telenursing care experiments, but all have included interactive video. In this context we use the term video-telephony to mean any sort of face-to-face video-communication (Figs 1, 2), in contrast to video-conferencing, which is a more general term, and in which more than one person may be present at the sites connected. Video-telephony allows care to be



Fig 1 A client from Kortrijk using the video-telephony service of the Belgian ACE TeleCommunity Project. The telephone network is used for the transmission of voice signals; video signals are transmitted through the cable television network.



Fig 2 Belgian ACE TeleCommunity Project. View from the service centre in Kortrijk.

provided in a face-to-face fashion for different categories of people with varying needs, for example people who have impaired mobility, speech, hearing, cognition or sight, who are mentally retarded, or who have a debilitating chronic or terminal illness. Several pilot studies have used video-telephony or investigated its feasibility in the care and support of these individuals.

Video-telephony has been used to assist people with hearing impairment or disability towards social integration and emancipation, and it has somewhat improved their quality of life²⁷. Brodin²⁸ concluded that video-telephony increased the quality of life of people with moderate mental retardation by extending their social network. Video-telephony stimulated communication and encouraged the maintenance of social contacts with parents, friends and staff. At the same time, clients increased their communicative abilities, which gave them the confidence to participate in normal social activities such as using the ordinary telephone. Magnusson²⁹ reported that for people with aphasia, the extra dimension of visual support provided by video-telephony improved their quality of communication and their social interactions.

Video-telephony has also proved effective in improving the end-stage care of terminally ill patients and their family at home³⁰. The possibility of video-communication with an interdisciplinary team 24 h a day increased their feelings of security and decreased their isolation. Likewise, video-telephony has helped to reduce social isolation for people with dementia as well as their carers at home³¹. For instance, video-telephony care increased the competence of the carers, which in turn improved their self-esteem³². Overall, care delivered via video-telephony has enhanced the quality of life of people with varying needs in versatile ways.

Video-telephony care for the elderly

Examples of video-telephony trials for the elderly include four projects funded by the European Union^{33–36}, work in Japan³⁷ and the USA^{38–40}, and a pilot trial in the UK⁴¹. These studies involved a wide range of video-supported services, ranging from emergency interventions—sophisticated alarm systems—to the delivery of therapy and rehabilitation. It is not always clear from the perspective of the client what interventions were involved. The degree of interaction between client and service provider varied from the giving of information, advice, guidance and counselling to the provision of psychological and psychotherapeutic procedures. Video-telephony interventions were defined in different ways, although they covered similar actions, such as training, therapy

and rehabilitation. Some services were provided regularly and others ad hoc; some were available only occasionally and others 24 h a day. Some trials focused on remote care on demand to give carers respite. Most trials were limited to small numbers of participants, who were frequently volunteers.

The main focus of the trial interventions was on the delivery of appropriate care on time. Elderly people in particular experience problems that are serious and even potentially fatal and therefore warrant immediate attention. Alarm systems are effective aids to support independent living but video-telephony has the extra advantage that service providers can immediately assess the risk and severity of each situation within the field of view of the camera, in order to call for appropriate help. It also allows them to reassure clients and to increase their feelings of social presence.

The deteriorating mobility experienced by many elderly people restricts their access to public facilities. Also, they often do not have access to alternative sources of information about health problems and community services. The providers of video-telephony services can offer them information in a personal and interactive way, which is adapted to their capacities. Video-telephony also offers an alternative means of dealing with personal matters, such as loss and death, worries, complaints, emotions and loneliness. A further step, which depends on having appropriate staff and technology, allows other nursing interventions to be performed, such as checking blood sugar concentrations, temperature, blood pressure or pulse. Finally, therapies that are normally begun in hospital or at a rehabilitation centre, such as memory training or speech therapy, can be followed up using video-telephony.

Video-telephony guarantees a more natural style of communication and this allows a personalized, trusting relationship to develop between client and staff. This in turn permits a degree of intimacy, for example in talking about needs, expectations and feelings.

Studies have shown that elderly people are neither uninterested in technology, nor incompetent in its use. Video-telephony has been well accepted, largely because of the visual contact it affords. Acceptance grows in proportion to experience: while some people may initially be somewhat reserved when communicating on camera, they generally find that face-to-face contact with the staff gives them more confidence in subsequent video-telephony interactions. Worries about privacy have not been a major concern. All video-telephony projects have shown that social isolation is not increased by use of the technique.

The personalized attention associated with video-telephony care appears to have created strong feelings of proximity, integration, security and safety. This has

prevented isolation and reduced loneliness, and led to improvements in personal health and wellbeing⁴². In addition to improving self-care, video-telephony has increased the participation of elderly clients in their health management. Many elderly people experience a direct, identifiable and significant improvement in the quality of their social and private lives, as well as, specifically, in overall functioning, levels of activity, memory, positive self-perception and maintenance of a network of friends, and a reduction of feelings of melancholy, social and emotional loneliness. Unfortunately, opinions still prevail and evidence is often lacking.

Nakamura *et al.*³⁷ reported that their test of video-telephony care encouraged the elderly to participate in community activities to such an extent that it resulted in a significant improvement in activities of daily living, communication and social cognition. After some initial scepticism, the care providers also recognized that video-telephony improved the quality of the care they were able to provide. The travel time saved increased the frequency of client interventions. Video-telephony allowed a better assessment of clients' emotional states and their need for support than did the telephone. The video-telephony staff also stressed the value of personal security. Video-telephony care supplemented traditional care at night and during the weekends.

Rosen⁴³ has suggested that the overuse of telenursing could be detrimental to both client care and nurse morale. The Kansas study suggested that approximately 45% of the on-site nursing visits could be replaced by video-telephony interventions⁴⁰, whereas the Belfast study indicated less than 15%⁴¹.

Johnston *et al.*^{38,44} found that the average video-telephony intervention was about 60% shorter than an on-site visit (18 min versus 45 min) and mentioned the potential for cost savings. Wheeler⁴⁵ stated that the cost of a video-telephony intervention was about two-thirds that of an on-site visit and allowed the nurse to attend to between 10 and 20 more clients per day. Chan *et al.*⁴⁶ also stated that telenursing care was economically attractive. Other advantages that have been mentioned are less travelling, no waiting times and the ability to provide just-in-time care.

The future

Further investigation is required of the extent to which nursing care delivered via video-telephony may substitute, supplement or strengthen traditional care for the elderly. One cannot extrapolate from video-telephony results in other health-care domains, such as

family medicine. Video-telephony care expands the traditional boundaries of health-care delivery for the elderly at home. It increases the autonomy, self-care, mental health and subjective wellbeing of the elderly at home and reduces their dependency on conventional nursing care. Video-telephony should introduce a new mode of proactive rather than reactive nursing care within a system of integrated care. Nurses can go where the elderly people are, instead of expecting that they will come to them. Although technology by itself is no panacea for the problems of ageing, when applied judiciously it can bolster the position of vulnerable ageing citizens. The studies of video-telephony care for the elderly have proved this point.

The technical infrastructure needs to be improved. The management of video-telephony care requires focus and evidence to direct it rather than woolly theorization. More refined management indicators have to be developed to provide answers to questions such as:

- (1) What interventions are needed for what types of elderly people?
- (2) What outcomes and health improvements can be expected?
- (3) What skills do the care providers need?

Careful experimental work is necessary that will result in management guidelines and indicators for video-telephony care.

Acknowledgements: We thank the European Union, the city of Kortrijk (Belgium) and its municipal welfare centre, the cable-television company and the non-profit organization Open Net for funding the video-telephony experiment.

References

- 1 World Health Organization. *The World Health Report 2000. Health Systems: Improving Performance*. Geneva: WHO, 2000
- 2 Gott M, O'Brien M. Attitudes and beliefs in health promotion. *Nursing Standard* 1990;**5**:30–2
- 3 Orem DE. *Verpleegkunde: Concepten voor de Praktijk* [Nursing: Concepts of Practice]. Utrecht: Lemma BV, 1992:19–23
- 4 Proot IM, Crebolder HF, Abu-Saad HH, Ter Meulen RH. Autonomy in the rehabilitation of stroke patients in nursing homes. A concept analysis. *Scandinavian Journal of Caring Sciences* 1998;**12**:139–45
- 5 Brownsell SJ, Bradley DA, Bragg R, Catlin P, Carlier J. Do community alarm users want telecare? *Journal of Telemedicine and Telecare* 2000;**6**:199–204
- 6 <http://www.catsca.org/articles/older.htm>. Last checked 25 June 2001
- 7 <http://www.infotech.monash.edu.au/itnr/reports/enemy.html>. Last checked 25 June 2001
- 8 Gilly MC, Zeithaml VA. The elderly consumer and adoption of technologies. *Journal of Consumer Research* 1985;**12**:353–7
- 9 Zimmer Z, Chappell NL. Receptivity to new technology among older adults. *Disability and Rehabilitation* 1999;**21**:222–30

- 10 <http://www.asaging.org/generations/gen-21-3/finn.htm>. Last checked 25 June 2001
- 11 Furlong MS. An electronic community for older adults: the seniornet network. *Journal of Communication* 1989;**39**:145–53
- 12 Billipp SH. The psychosocial impact of interactive computer use within a vulnerable elderly population: a report on a randomised prospective trial in a home health care setting. *Public Health Nursing* 2001;**18**:138–45
- 13 Lesnoff-Caravaglia G. Old age, ancient attitudes and advanced technology. *Ageing and Society* 1989;**9**:73–7
- 14 <http://www.lboro.ac.uk/research/husat/include/1-4.htm>. Last checked 25 June 2001
- 15 Burdick AE, Mahmud K, Jenkins DP. Telemedicine: caring for patients across boundaries. *Ostomy/Wound Management* 1996;**42**(9):26–37
- 16 Mair FS. Home telenursing/telehealthcare. In: Wootton R, ed. *European Telemedicine*. London: Kensington Publications, 1999: 133–5
- 17 Warner I. Introduction to telehealth home care. *Home Healthcare Nurse* 1996;**14**:790–6
- 18 <http://www.tradepartners.com/Uk/Company/Queens/paper1.htm>. Last checked 25 June 2001
- 19 <http://www.telemetoday.com/specialty/Strategies.htm>. Last checked 25 June 2001
- 20 Barron A. Health over the phone. *Nursing Standard* 1996;**10**:25–7
- 21 Yensen J. Telenursing, virtual nursing, and beyond. *Computers in Nursing* 1996;**14**:213–14
- 22 <http://www.nysna.org/pages/report/ja12.htm>. Last checked 25 June 2001
- 23 Warner I. Telehealth in home care practice. *Journal of Nursing Administration* 1998;**28**:3,16
- 24 <http://www.telemetoday.com/articles/Tele-home%20healthII.htm>. Last checked 25 June 2001
- 25 <http://www.nursingworld.org/readroom/tele2.htm>. Last checked 25 June 2001
- 26 <http://www.nysna.org/pages/report/ja12.htm>. Last checked 25 June 2001
- 27 <http://www.stakes.fi/cost219/videotelephony.htm>. Last checked 6 July 2001
- 28 Brodin J. Still picture telephones as communication aids for people with mental retardation—a Swedish perspective. *Eurorehab* 1993;**3**:163–8
- 29 <http://www.csun.edu/cod/95virt/0009.html>. Last checked 25 June 2001
- 30 <http://www.cicall.com/videophone/solutions/hospice.htm>. Last checked 25 June 2001
- 31 <http://www.slads.freeuk.com/slads/Technology/Assistiv.html>. Last checked 25 June 2001
- 32 Magnusson L, Berthold H, Chambers M, Brito L, Emery D, Daly T. Using telematics with older people: the ACTION project. Assisting carers using telematics interventions to meet older persons' needs. *Nursing Standard* 1998;**13**:36–40
- 33 Erkert T, Robinson S. *Videotelephony: Support for Elderly People*. In: Ballabio E, Placencia-Porrero I, Puig de la Bellacasa R, eds. *Rehabilitation Technology, Strategies for the European Union, Technology and Informatics 9*. Amsterdam: IOS Press, 1993:86–92
- 34 <http://www.stakes.fi/promise/book/pr18appe.htm#081>. Last checked 6 July 2001
- 35 <http://www.stakes.fi/cost219/COSC310.HTML> (EUR 13845). Last checked 6 July 2001
- 36 Cullen K, Robinson S. *Telecommunications for Older People and Disabled People in Europe. Preparing for the Information Society*. Amsterdam: IOS Press, 1999
- 37 Nakamura K, Takano T, Akao C. The effectiveness of videophones in home healthcare for the elderly. *Medical Care* 1999;**37**:117–25
- 38 Johnston B, Wheeler L, Deuser J, Sousa KH. Outcomes of the Kaiser Permanente Tele-Home Health Research Project. *Archives of Family Medicine* 2000;**9**:40–5
- 39 Hornick DN, Kline A. Application and feasibility of video telecommunications in home healthcare. *Telemedicine Today* 1997;**5**(6):28–31
- 40 Whitten P, Collins B, Mair F. Nurse and patient reactions to a developmental home telecare system. *Journal of Telemedicine and Telecare* 1998;**4**:152–60
- 41 Wootton R, Loane M, Mair F, et al. A joint US–UK study of home telenursing. *Journal of Telemedicine and Telecare* 1998;**4**:83–5
- 42 Erkert T. High-quality television links for home-based support for the elderly. *Journal of Telemedicine and Telecare* 1997;**3**:26–8
- 43 <http://telemetoday.com/articlearchive/articles/Telehomenurse.htm>. Last checked 25 June 2001
- 44 Johnston B, Wheeler L, Deuser J. Kaiser Permanente Medical Center's Pilot Telehome Health Project. *Telemedicine Today* 1997;**5**(4):16–19
- 45 Wheeler T. Strategies for delivering tele-home care: provider profiles. *Telemedicine Today* 1998;**6**(4):37–40
- 46 Chan WM, Woo J, Hui E, Hjelm NM. The role of telenursing in the provision of geriatric outreach services to residential homes in Hong Kong. *Journal of Telemedicine and Telecare* 2001;**7**:38–46