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*A Systematic Review of Practice
Standards and Research Ethics
in Technology-Based Home
Health Care Intervention
Programs for Older Adults*

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Objective: The purpose of the review is to assess frequencies of reporting adherence to professional practice standards and research ethics in studies of technology-based home health care programs. **Methods:** Key databases were searched to yield 2,866 abstracts that were independently rated by two reviewers using inclusion-exclusion criteria, resulting in 107 articles that were then reviewed for reports of practice standards and research ethics. **Results:** Issues related to professional practice standards and research ethics were not well reported. When reported, adherence to practice standards included preintervention training, use of intervention protocols, supervision, and mechanisms for risk management. Research ethics most commonly reported were informed consent, REB/IRB approval, and protection of privacy. **Discussion:** The results raise questions as to whether practice standards and research ethics are addressed sufficiently when health service delivery occurs in technology-based environments. Guidelines for professional accountability in e-health service delivery are needed.

Keywords: *clinical practice standards; research ethics; technology-based homecare*

Increasingly, various forms of technology are being used to deliver health care, to involve patients in their own care, and to make health care delivery more cost efficient. Technology-based programs are

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used routinely for physician-to-physician consultation, monitoring of medical procedures, education of health care professionals, and posting of health information on Internet Web sites. In addition, many health care providers are evaluating new models for communicating with patients in their homes through the use of the Internet and/or televideo monitoring devices. With the advent of voice-over-IP (Internet protocol) and the development of software to support Internet-based videoconferencing, health care systems worldwide will be developing and evaluating the efficacy of health care interventions delivered via the Internet to persons in their homes or at work. In terms of consumers of health services, computer-literate baby boomers will expect access to health care systems using multiple forms of technology. Also, older adults without prior computer skills are now the fastest growing cohort of Internet users and use the World Wide Web mostly to access health care information (Brintnall-Peterson, 2003). This trend toward consumers' increasing comfort with using technology for health care suggests a shift. Instead of depending on health care providers to monitor patients' health issues, individuals can take responsibility for their own health care by using technological advances for self-monitoring and self-efficacious behavioral change (Wrosch, Schulz, & Heckhausen, 2004).

Technological delivery of health care to patients in their homes is increasingly feasible because of the expanding use of the Internet, with approximately 606 million users worldwide (Nua Internet Surveys, 2002). This expansion has meant that isolated and underserved populations can now be reached and that services can be provided using text and video modes of communication across the Internet. Health services delivered to patients in their homes include patient assessment, postacute care monitoring, and the provision of Internet-based health support and mental health interventions. In fact, the greatest increase in the use of technology has occurred in mental health, with more than 250 private practice Web sites and e-clinics and with the number of e-therapists expected to exceed 5,000 by 2005

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(Kanani & Regehr, 2003). In particular, telehealth has provided a means of reducing some of the barriers that older adults experience in accessing health and social services (Childress, 2000) and has contributed to their improved quality of life (Infante-Rivard, Krieger, Petitclerc, & Baumgarten, 1988; Roush & Teasdale, 1997).

Advances in the use of technology in health care delivery raise unique questions with regard to standards of professional practice and research ethics that have not been well addressed in the literature (Bauer, 2001). Although health professionals have well-defined ethical codes of conduct, most have not adapted or developed specific codes of professional conduct that apply when providing services using technology (Dyer, 2001). Areas of concern related to technology-based health care include insuring confidential communication and patient privacy (Childress, 2000; Kanani & Regehr, 2003; Stanberry, 2000), monitoring quality of technology-transmitted health information (Eysenbach & Diepgen, 1998), cautioning patients about adopting Internet-recommended treatments in lieu of evidence-based treatments (Cooper, 2002), preventing miscommunication in a text-based environment caused by the absence of visual and auditory cues (Childress, 2000; Stanberry, 2000), and insuring adherence to professional practice standards in technology-based health service delivery (Weiss, 2004). Some of these concerns are beginning to be addressed through, for example, monitoring of Web sites to ensure that information adheres to American Medical Association guidelines, securing of patient information on interactive Web sites, and securing of user privacy (Anselmo, Lash, Stieb, & Haver, 2004).

There have been some attempts to establish professional practice guidelines and research ethical standards for technology-based health service programs (American Psychological Association, 1997), and some jurisdictions are generating national policies for the delivery of technology-based health care services (National Initiative for Telehealth, 2003). However, the guidelines are nonspecific to any professional group and vague with respect to professional practice standards. Currently, there are no ethical codes of conduct that each professional health discipline is required to adopt when using technology for the provision of health care services (Stanberry, 2000). Similarly, there is no professional health care regulatory body or monitoring system that

holds organizations accountable for the health information or services provided using technology.

Despite the lack of guidelines for insuring quality e-health programs, new technology-based programs are being developed and evaluated in a health policy environment. Health care consumers and service purchasers (private and public) are demanding performance indicators, including clinicians' adherence to core competencies supported by evidence for practice outcomes (Lied & Kazandian, 1999; Sheldon, 1998). Evidence for practice competence and for optimal outcomes for the health care consumer is typically generated from randomized controlled trials (RCT) that provide the gold standard for insuring that a health care intervention is effective (American Psychological Association, 1995; Sackett, Strauss, Richardson, Rosenberg, & Haynes, 2000). For reliable replication of an intervention, training manuals, practice protocols, treatment algorithms, or clinical pathways are used to train and monitor clinicians in carrying out the intervention reliably. Rigorously controlled studies also include independent evaluation of the clinician's performance subsequent to training to insure reliable adherence to the intervention strategies. Although there is considerable debate about whether clinicians should be required to adopt models of evidence-based practice, researchers are required to demonstrate the internal validity of randomized controlled studies of models of intervention, including the use of strategies that insure reliable adherence to the study protocol. Professional practice standards generated from the results of RCTs provide the basis for judging levels of performance regulated by each professional discipline. These standards of practice apply regardless of the health care environment in which they are applied (in the clinic, in the patient's home, face to face, or via telehealth). Clearly, telehealth professional practice standards must match clinic-based standards of practice. The achievement of this goal will require close scrutiny of the risks for intervention errors caused by technological barriers, such as the absence of audio and visual cues, that interfere with accurate observation and information transmission.

The degree to which clinicians address professional practice standards and research ethics in telehealth programs is unknown. To date, most of the disseminated research on the ethical and legal aspects of

telehealth has focused on the risks associated with protecting patient privacy and confidentiality and on issues related to informed consent. Less attention has been paid to other important ethical issues, such as insuring high standards of clinical practice and minimizing the risks for adverse health outcomes for patients who receive health care using technology. To address this gap, a systematic review of published studies of technology-based interventions delivered to older adults in their homes was conducted. The purpose of the review is to determine whether adherence to professional practice standards and implementation of research ethics procedures are discussed in reports of studies of e-health service programs.

Method

SEARCH STRATEGY AND SELECTION CRITERIA

The following databases were searched to identify potential articles for inclusion in the sample: Medline (1966 to March 2003), Cinahl (1982 to March 2003), and PsycINFO (1974 to March 2003). To capture all relevant articles, the search strategy involved the following steps: (a) using *telemedicine, telehealth, Internet, electronic communication, electronic mail, computer communication, World Wide Web, and e-health* as either subject headings, thesaurus terms, or key words to identify studies that used technology; and (b) using *methodology, experimental design, experimentation, measurement, research, clinical trial, survey, and data collection* as either a MeSH (medical subject heading) or key word to identify studies that included an intervention. Excluded were nonoriginal research articles (e.g., reviews, editorials), studies using technology for data collection only, and studies that did not include an interaction between a health professional and a patient, such as professional-to-professional communications about a patient. After removing the duplicates, the search strategy yielded 2,866 abstracts (Medline $n = 1,289$; Cinahl $n = 1,193$; PsycINFO $n = 384$).

Next, two reviewers independently reviewed all abstracts ($N = 2,866$) according to the following criteria:

1. Technology (e.g., telephone, Internet, videoconferencing) was used to deliver an intervention or service. Excluded were abstracts reporting use of technology for the provision of information only.
2. The articles reported either descriptive or quantitative studies of the technology-based intervention, program, or service.
3. The articles reported technology-based service provision involving interactions between clinic-based health professionals and adult patients in their homes.

A consensus meeting was held with a third reviewer to resolve any disagreement, resulting in the inclusion of 248 articles.

The inclusion-exclusion criteria were then reapplied to the full text of each article to determine with certainty that they met the selection criteria. Of the initial 248 articles, 55 were excluded for one of the following reasons: did not fully meet the criteria ($n = 31$), could not be obtained within time frame of review ($n = 3$), was not in English ($n = 1$), were brief reports ($n = 16$), or were dissertations ($n = 4$). A final screening of the remaining 193 articles ensured that the included studies focused on the use of technology for providing health care to older adults in their homes. Articles were then selected if the study population was age 65 or older. When age was not reported, articles were selected on the basis of topic relevance to older adults (e.g., cancer, smoking, bereavement), and nonrelevant topics (e.g., pregnancy, gestational diabetes, maternal fatigue) were excluded. This process resulted in a final sample of 107 articles.

DATA EXTRACTION AND ANALYSIS

A data collection instrument was developed following reviews of data collection strategies used in other health ethics reviews (Eysenbach & Kohler, 2002; Jadad et al., 1996; Karlawish, Hougham, Stocking, & Sachs, 1999; Ruiz-Canela, de Irala-Estevez, Martinez-Gonzalez, Gomez-Gracia, & Fernandez-Crehuet, 2001) and reviews of professional and research ethic guidelines recommended for technology-based service delivery (American Psychological Association, 1997; Childress, 2000; Dyer, 2001; E-Risk Working Group for Health Care, 2001; Health on the Net Foundation, 1997; Kanani & Regehr, 2003; National Initiative for Telehealth, 2003; Rippen, 2000; Stanberry, 1998a, 1998b; Winker et al., 2000). The resulting data collection form

was pilot tested and revised, and the final draft included research study methods, characteristics of the patient population, program information and type of technology used, professional practice standards and ethics (e.g., privacy and confidentiality, security of data, liability issues, and professional standards and accountability), research ethics (e.g., research ethics board [REB] and/or institutional review board [IRB] approval, informed consent, participant capacity to consent, honorarium), and peer or nonpeer review. Two reviewers used the data collection form to independently extract information from each article. A third reviewer was used if necessary to maintain reliability.

A second data extraction procedure was used to examine more specifically adherence to professional practice standards. For this analysis, only the RCT studies were used ($n = 26$) because they should have the strongest internal validity for establishing evidence for practice. The purpose was not to assess the overall quality of reporting of randomized trials (Jadad, 1998; Moher, Schulz, & Altman, 2001). Rather, the focus was on the reporting of strategies used to insure the internal reliability of the study design, including reliable adherence to an intervention protocol. Each RCT was coded as to discipline providing the intervention, whether preintervention training had occurred, whether a protocol of guidelines was used, whether supervision of the intervention had been provided, and whether there had been an independent assessment of provider adherence to the intervention protocol.

Descriptive statistics and chi-square tests were used to describe the study characteristics and for the analysis of the reported ethical and practice standard issues.

Results

STUDY CHARACTERISTICS

Of the 107 articles reviewed, more than half were in peer-reviewed journals (64%). Most studies were conducted in North America (70%), and most others in Europe (20%). Diseases included chronic conditions (60%), such as chronic heart failure, cancer, diabetes, and hypertension. Twenty percent referred to nonspecific conditions, such

as general health or psychiatric problems. In terms of study design, half were nonrandomized controlled trials, and about one quarter were either randomized controlled trials or descriptive studies. The interventions included medical symptom monitoring (67%), cost benefit or effectiveness analysis of interventions (14%), individual counseling (12%), support groups (11%), and self-help groups (1%). Synchronous technology, allowing participants to communicate in real time, was used in three quarters of the articles (75%). Audio technology, such as voice mail and audio clips or files, was used most often (60%), followed by synchronous video (49%). The use of nonsynchronous communication was reported in 40% of the articles, including text (77%), audio (14%), or video (7%) formats. Other forms of asynchronous communication (8%) included photographs and home-based sensory devices that transmit data to the health care provider.

STUDY POPULATION

As indicated in Table 1, about one third of the articles did not clearly report age, gender, or ethnicity of the participants. The patient groups receiving technology-based care were not well described, whereas the discipline of health care providers was always identified. Professionals involved in the interventions were primarily nurses (59%) and physicians (29%).

PROFESSIONAL STANDARDS OF PRACTICE AND RESEARCH ETHICS

Because the full sample ($N = 107$) data referenced both professional practice codes of ethics and research ethics (e.g., privacy and confidentiality), the results are reported in Table 2, on overall ethical issues considered. Of the 10 standards and ethics issues examined, the mean number reported in the articles was 2.99. Eight articles failed to report on any of the 10 ethical issues, and almost half of the sample (48%) reported fewer than 3 ethical issues. Informed consent (50%), a mechanism for monitoring participants (38%), confidentiality and protection of privacy (27%), REB or IRB approval (26%), and a mechanism for contacting the health provider (22%) were most commonly reported. Other ethical issues rarely reported included the

Table 1
Description of the Study Characteristics (N = 107)

<i>Characteristic</i>	<i>n</i>	<i>%^a</i>
Journal type		
Medical	26	24
Nursing	20	19
Allied health	17	16
Quality assurance and/or management	5	5
Technology ^b	39	36
Peer reviewed	68	64
Location of study		
North America	75	70
Europe	22	20
Asia	5	5
Australia	4	4
Multicontinent	1	1
Topic		
Specific chronic conditions (e.g., diabetes)	64	60
Specific acute conditions (e.g., myocardial infarction)	9	8
Nonspecific conditions (e.g., general health problems)	21	20
Caregiving (e.g., for dementia)	8	7
Psychosocial issues (e.g., bereavement)	5	5
Study design		
RCT	26	24
Non-RCT	57	53
Descriptive only	24	22
Model of intervention ^c		
Medical symptom monitoring	72	67
Support group	12	11
Individual counseling	13	12
Self-help group	1	1
Cost benefit or effectiveness analysis	15	14
Other	43	40
Type of technology used		
Synchronous only (e.g. instant messaging)	64	60
Asynchronous only (e.g., e-mail)	27	25
Both	16	15
Health professional involved ^d		
Physician	31	29
Nurse	63	59
Social worker	6	6
Rehab therapist (e.g., speech therapist, occupational therapist, physiotherapist)	9	8
Psychologist	2	2
Multidisciplinary team	12	11
Other (e.g., dietician, exercise physiologist)	23	22
Funding source reported	62	58

(continued)

Table 1 (continued)

Characteristic	n	% ^a
Peer-reviewed funding		
Yes	41	38
No	21	20
Not applicable	45	42
Participant characteristics		
Age groups reported as included		
65 and over	74	69
Unknown or not clearly stated	33	31
Gender		
Females only	3	3
Males only	0	0
Both	63	59
Unknown or not clearly stated	41	38
Ethnicity		
Caucasian only	1	1
Non-Caucasian only	4	4
Both Caucasian and non-Caucasian	24	22
Unknown	78	73
Target population		
Caregiver only	11	10
Older adults only	72	67
Both caregivers and older adults	7	7
Unclear	17	16

a. Percentages may not add up to 100 because of rounding.

b. All journals that covered medical, nursing, or allied health topics but also included technology were classified as technology journals (e.g., *Journal of Telemedicine and Telecare*).

c. Totals may be greater than 107 or 100% because articles may have reported using multiple intervention components.

d. Totals may be greater than 107 and 100% because interventions may have had more than one health professional involved.

capacity of participants to consent (9%), whether the article stated that an honorarium or incentive was provided to participants (5%), and the disclosure of whether the sample included cognitively impaired participants (2%).

To examine differences in reporting between peer reviewed and non-peer-reviewed articles, a chi-square test was used. Peer-reviewed journals were more likely than non-peer-reviewed journals to report REB or IRB approval (82% vs. 18%, $\chi^2 = 5.659$, $p = .017$) and to report obtaining informed consent (74% vs. 26%, $\chi^2 = 4.564$, $p = .033$).

Table 2
*Reporting of Professional Practice Issues and Research Ethics in Articles Describing
 Technology-Based Interventions Delivered to Older People in Their Homes (N = 107)*

<i>Ethical Consideration Reported</i>	<i>Yes</i>		<i>No</i>		<i>Unclear</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Approval from REB ^a or IRB ^b	28	26	79	74		
Obtainment of informed consent	53	50	54	51		
Capacity of participants to consent	10	9	97	91		
Inclusion of cognitively impaired participants	2	2	53	50	52	49
Use of professional standards for ethical practice	2	2	105	98		
Use of research ethical codes	1	1	106	99		
Use of incentives or honorarium for participants	5	5	102	95		
Confidentiality, protection of privacy, or security	29	27	78	73		
Liability and/or legal issues	7	7	100	94		
Mechanism for monitoring subjects (e.g., safety, adverse events, side effects, negative outcomes, professional accountability)	41	38	66	62		
Mechanism for subjects to contact the health provider (e.g., assistance required, side effects, questions)	23	22	84	79		
Internet only						
Use of the Internet	59	55	48	44		
Use of firewalls	2	3	57	97		
Use of a password	10	17	49	83		
Security of data	10	17	49	83		
Backup data storage systems	2	3	57	97		
Use of encryption to secure the site	4	7	55	93		

Note. Percentages may not add up to 100 because of rounding.

a. REB = research ethics board.

b. IRB = institutional review board.

However, peer-reviewed journals were less likely than non-peer-reviewed journals to report a mechanism for study participants to contact a health provider (44% vs. 57%, $\chi^2 = 5.096$, $p = .024$). The majority of articles (94%) did not report whether liability or legal issues had been addressed.

Fifty-nine of the studies (55%) reported using the Internet to provide an intervention. Of these, use of a password (17%) and securing of data (17%) were most commonly reported. The use of encryption (7%), back-up data storage systems (3%), and firewalls (3%) were rarely reported. The majority of studies (70%) did not report using any of the safeguards mentioned above. Most reported using fewer than

three of the five safeguards typically used to protect client privacy and information when using the Internet to provide services.

The analysis of the RCT studies showed that 42% (11 of 26 studies) provided some details as to procedures used for insuring reliable adherence to a specified model of intervention. Only 38% (10 of 26) reported using protocol guidelines for delivering the intervention, 19% (5 of 26) provided information about training the clinician prior to beginning the trial, and 12% (3 of 26) indicated that the clinician received supervision for the duration of the trial. None of the studies reported independent assessment of archived interactions between provider and patient to demonstrate whether the intervention had been delivered reliably according to protocol. Ten studies (38%) provided no information as to the use of strategies for insuring adherence to intervention protocol.

Discussion

The findings show that issues concerned with professional practice standards and research ethics are not well documented in studies of technology-based health care programs delivered to older people in their homes. Of particular concern was the paucity of reports about using professional practice guidelines or adhering to research codes of ethics when delivering technology-based health care interventions. The results also showed that studies of professional intervention programs using the Internet provided no information about safeguards put in place to protect client identity or privacy or about the potential exposure to clinical risk factors. It may be that clinicians and researchers believe that technology-based homecare programs match the clinical practice standards and research ethics that apply in face-to-face delivery of health care services. Specifically, the results of this review suggest that clinicians and researchers need to provide evidence that professional practice standards and research ethics are upheld in technology-based health care environments.

Overall, about one half of the sample showed that only two to three issues concerned with professional practice standards and research ethics were consistently reported. Although no previous studies have examined the reporting of professional practice standards and research

ethics in telehealth environments, the results of this study parallel those observed in reviews of the clinical and research literature. For example, in a review of more than 400 non-technology-based research reports published in two major medical education journals, the authors examined whether or not six important ethical research criteria had been reported and found that nearly half of the studies failed to report meeting any of the six research ethics criteria (Weiss Roberts, Geppert, Connor, Nguyen, & Warner, 2001). For the remaining studies, no single article reported that all six elements of research ethics had been addressed. Similarly, Karlawish et al. (1999) reviewed studies of clinical research with nursing home residents and found that even minimal requirements for insuring research ethics were not typically reported.

These results are similar to reviews of quality of methods reported in RCTs where the average quality of reporting was low (Huwiler-Muntener, Juni, Junker, & Egger, 2002). Furthermore, criteria used for judging the methodological merits of RCTs have focused primarily on type of randomization, blinding, and adverse events (Moher et al., 2001), with only one criterion referencing interventions (“precise details of the interventions intended for each group and how and when they were actually administered,” p. 1981). Because, in medicine, many RCTs focus on pharmaceutical interventions, the CONSORT quality criteria ensure rigor of sampling, randomization, blinding, and recording of adverse events, with minor attention to reliable adherence to an intervention protocol (Moher et al., 2001). However, when the intervention combines assessment strategies with the provision of medical information, advice, referrals, and psychosocial support, the intervention package would need to meet practice standards of professional health care that apply to the specific disease being monitored. The review of the RCTs showed that almost half of the studies provided no information about insuring reliable adherence to a valid intervention protocol, despite the fact that most used a combination of interventions. In all but one of the RCTs, the practitioners were nurses, and in four of the studies, “nurse specialists” in the disease area (e.g., diabetes, congestive heart failure, hypertension) were specified. However, in many of the RCTs, the researchers did provide the nurses’ academic and/or training credentials and years of experience.

In terms of the reporting of research ethics, obtaining informed consent and REB or IRB approval were not well reported in the study sample. Peer-reviewed articles, in contrast to non-peer-reviewed articles, were more likely to report use of both of these strategies for meeting research ethical standards. Ruiz-Canela et al. (2001) consider ethics board approval and obtaining informed consent as the two most important research ethics issues that investigators need to address and report consistently in journal publications. In their review of clinical trials ($N = 767$), they cross-coded methodological rigor with the use of ethics protocols. Studies that were methodologically flawed were less apt to report research ethics procedures (Ruiz-Canela et al., 2001). In contrast, this systematic review found no consistent correlation between methodological rigor and quality of reporting of research ethics procedures. Reporting of important ethical issues relevant to older people was rare. For example, reporting the participant's capacity to provide informed consent and reporting whether cognitively impaired adults were included in the technology-based interventions were uncommon. Older adults who are cognitively impaired and who may not be capable of providing informed consent may be at greater risk of having their rights to privacy ignored, especially when technology is used to deliver health care services.

IMPLICATIONS FOR TECHNOLOGY-BASED PRACTICE

The lack of professional practice standards or code of ethics for guiding clinical practice in technology-based environments is of increasing concern to health care providers and consumers (Bauer, 2001). In particular, there is concern about providing telehealth services to older adults in their homes. Because older adults may experience challenges in using technology to assist in monitoring their own health and insuring their safety, the inclusion of procedures for study participants to be able to contact a health care provider at any time is essential. These concerns suggest that two key questions need to be addressed: (a) Do technology-based health care services meet the same professional practice standards that apply when the service is delivered face-to-face, and are the outcomes similar? (b) How is client privacy secured when information is transmitted using technology?

The effectiveness of telemedicine is unknown (Robinson, Patrick, Eng, & Gustafson, 1998). A systematic review of the literature that surveyed more than 1,000 articles suggests that there are few data available to support the effectiveness of telemedicine (Roine, Ohinmaa, & Hailey, 2001). Most of the studies refer to pilot projects and short-term outcomes. Despite the positive results of pilot studies that show benefits of telehealth services delivered to older adults in their homes, there are few randomized controlled trials comparing telehealth interventions with conventional care practices (Jennett et al., 2003). Of particular concern to physicians is the quality of the clinician-patient relationship necessary for delivering optimal health care, regardless of whether the relationship develops in a face-to-face context, via e-mail, or on the telephone (Weiss, 2004). The monitoring of professional practice standards is challenging in any health service environment, whether hospital based or home based. Patients are particularly at risk when mental health services are offered on the Internet because they have no way of judging the credentials or competence of cybertherapists (Kanani & Regehr, 2003). Similarly, when consumers access Web sites for health information, there are few guidelines for judging the authenticity of the information. The maintenance of professional practice standards in a telehealth environment may be best assured when evidence-based models of practice are transferred to the technology-based application of the intervention. For example, Bouchard et al. (2004) compared the effectiveness of cognitive-behavior therapy for panic disorder delivered either face-to-face or by televideo using an evidence-based intervention protocol and showed comparable outcome results between the groups.

With the rapid development of Web applications that can support synchronous videoconferencing, it will be increasingly feasible to use the Internet to provide a wide range of health care programs. Consequently, clinicians will be required to address the protection of patient information and client privacy within an Internet service-delivery environment. The use of password-protected Web site access, encryption, and firewalls should be mandatory for any exchange of information between a health care provider and a patient. This perspective is corroborated in part by the U.S. Department of Health and Human Services' adoption of Health Insurance Portability and Accountability Act (HIPAA; 1996) regulations for safeguarding the integrity, confi-

dentiality, and availability of electronic health information pertaining to individuals. Whereas the HIPAA does not apply the ruling to noncovered entities, we would recommend that the digital exchange of health information ruling be applied to all health professionals and health service organizations.

Similarly, patients have the right to know that the services they receive in a technology-based environment meet the highest professional standards of care. Of particular concern is the lack of regulation of who can offer health services using the Internet. As indicated above, there has been a significant escalation in the provision of psychotherapy via the Internet, yet there is no regulating system for monitoring the credentials of the providers and whether evidence-based models of therapy are used. Ultimately, each member of a health care discipline will need to self-monitor the quality of professional practice behaviors, whether delivered in a face-to-face or technology-based environment. When professional health services are transmitted through technological devices, additional caution may need to be exercised so as to insure protection of older adults who may be especially vulnerable when receiving technology-based services in their homes. In summary, answers to the questions raised can be addressed only through research initiatives focused on demonstrating that both high quality health care and secured patient privacy can be provided when technology is used to deliver health care services.

STUDY LIMITATIONS

There are two main study limitations. First, limited databases were used to extract relevant articles (i.e., Medline, Cinahl, and PsychINFO). Second, these results capture only what authors reported and may not necessarily reflect whether the standards and ethics issues considered had in fact been addressed.

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