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13 CyberPsychology meets clinical psychology: The emergence of e-therapy in mental health care

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Abstract. Clinical psychologists have traditionally shied away from technology, perhaps because many of the therapeutic elements of psychotherapy rely on verbal and nonverbal interpersonal communication. Although nothing will ever replace face-to-face communication as the key element of psychological practice, the advance of technology is now offering new communication tools that psychologist and their patients feel comfortable using for clinical care.
This chapter presents the concept of e-therapy and examines the possible role of Internet and related media in psychotherapy. Current clinical applications are presented including equipment, research, and examples of direct clinical care. Different modes of online mental health care, including e-mail counselling, self-help therapy and self-help groups are analysed and discussed. The chapter also focuses on the technology used in e-therapy – email, IRC, videoconference - providing information about the equipment and its clinical use. A particular focus is given to the analysis of shared hypermedia, new Internet tools in which different users, who are simultaneously browsing the same Web site, can communicate and share files. The chapter concludes with suggestions for evaluating the value of adding e-therapy to existing clinical practices.

Contents

13.1 Introduction

Clinical psychologists have traditionally shied away from technology, perhaps because many of the therapeutic elements of psychotherapy rely on verbal and nonverbal interpersonal communication.

Although nothing will ever replace face-to-face communication as the key element of psychological practice, the advance of technology is now offering new communication tools that psychologist and their patients feel comfortable using for clinical care.

As noted by Jerome and Zailor [1]: "emerging technology will perpetually alter the health care environment, continuously changing the tools and options that are available to therapists. It is thus important to study the impact of these changes as they occur, and it is imperative that new technological competencies be developed as clinicians integrate these technologies into their research and practice" (p. 478). In general, distributed communication media could become a significant enabler of consumer health initiatives. In fact they provide an increasingly accessible communications channel for a growing segment of the population. Moreover, in comparison to traditional communication technologies, shared media offer greater interactivity and better tailoring of information to individual needs.

Nickelson [2] defined as *telehealth* the use of telecommunications and information technology "to provide access to health assessment, diagnosis, intervention, consultation, supervision, education and information, across distance" (p. 527).

Telehealth means "medicine at distance" where "medicine" includes not only medical activities - involving ill patients - but also public health activities - involving well people [3]. In other words telehealth is *process* and not a technology, including many different health care activities carried out at distance.

E-therapy, the use of Internet and related media in clinical psychology is the next logical step. Although e-therapy is a branch of telehealth, it is differentiated in several important ways. As noted by Allen [4] telehealth to date has been largely non-Internet based and has been characterized by point-to-point (e.g., T1) and dial-up (e.g., telephone, ISDN) information exchange. E-therapy, on the other hand, is more accessible due to its increasingly affordable ability to communicate through a common set of standards and across operating systems.

The basic idea is to use the power and convenience of Internet to allow simultaneous (synchronous) and time-delayed (asynchronous) communication between an individual and a professional. From this point of view, e-therapy represents neither a substitute to traditional psychotherapy nor an alternative to psychological counselling [5]: it provides different innovative, powerful tools that have the potential to *enhance* the effectiveness of the communication within the therapeutic process. In addition, the Internet can allow the provision of appropriate health assistance in remote areas where there are not specialized staff and facilities.

As the availability of new communication technologies expands the ways in which treatment can be provided, psychologists will incorporate these innovations into their practice and research. The purpose of this chapter is to review the effects of the Internet and related media on the field of psychology and to discuss the implications of these changes for the clinical practice.

However, different types of Internet media, such as chat, e-mail and video teleconferencing may present differing challenges and opportunities [1, 6]. Thus, the first section of this chapter introduces the reader to the rationale of e-therapy by providing an overview of the current applications in this field. In the second section a critical analysis of e-therapy tools currently available for psychotherapy is provided. Starting from the results of this analysis, the third section discusses how *shared hypermedia*, the most innovative of the e-therapy tools presented, could be used in mental health care. Finally, fundamental issues having important implications for the feasibility of the application of Internet media in psychotherapy are discussed.

13.2 The use of e-therapy in mental health care: Rationale and applications

The rapid technological evolution of the media suggests that Internet - a global computer network that connects ever-growing numbers of local networks and computers - will become the predominant communicational tool in the next future. Psychology is now discovering the great opportunities inherent in this medium. A number of psychological resources are already available for professionals and common users, covering all kinds of information on psychological concepts and issues, scientific research, clinical testing and assessment [1, 6, 7]. Among these applications, Internet-aided psychotherapy is rapidly emerging as one of the most interesting one [8]. In fact, during last years mental health professionals worldwide are pioneering new services that offer to establish a therapeutic relationship over the Web, sometimes on a fee basis. There are two main psychotherapy areas where the Internet has been applied so far: individual therapy and self-help therapy.

13.2.1 Individual telepsychotherapy

The first area in which the Internet can offer significant advantage is telepsychotherapy.

Remote psychological consultation, for example, could give clients greater access to skilled mental health professionals regardless of geographical proximity. Although efficacy of the use of remote consultation in psychotherapy is not yet fully understood, the technological advances have allowed the publication of some pioneering works with good and promising results. Klein and Richards, for example, investigated the effectiveness of an Internet-based intervention for people with panic disorder [9]. Participants meeting criteria for panic disorders were randomly assigned to either the treatment or a self-monitoring control condition. After the study, participants were assessed on measures pertaining to panic, negative affect, body vigilance, anxiety sensitivity and self-efficacy in managing panic. The treatment condition was associated with significant reductions in all variables except anxiety sensitivity and depressive affect [9].

Botella et al. [10] developed a telepsychology system for the treatment of public speaking fear. The system is composed of three main parts. The first component is a structured assessment protocol that gives the patient a diagnosis of his/her problem; the second component is represented by a structured treatment protocol, organized in separate blocks reflecting the patient's progress. The third part is an outcome protocol that assesses treatment effectiveness, not only at its end, but also at every intermediate step [10].

Murdoch and Connor-Greene reported two clinical cases where e-mail was used as an adjunction to therapy to enhance patient's involvement in treatment [11]. In both cases, patients' reports suggest that therapeutic alliance and therapeutic impact improved with the use of e-mail homework reporting. The authors attribute this improvement to the fact that some patients have fewer problems when they talk about personal issues using e-mail than when they are in a face-to-face setting. For this reason the use of email makes more likely that unknown aspects of the patient personality will emerge. In fact, patients may use their e-mail communication to reveal more about themselves, without having to be reactively attentive on a moment-to-moment basis to clinicians' comments or body language [11].

Yager has used e-mail like a therapeutic adjunct in the outpatient treatment of anorexia nervosa [12]. Results of this study showed a clinical improvement for all patients included in the experimental group. Furthermore, patients accepted the rationale of using e-mail as therapeutic adjunct and they considered it helpful.

In another study, Bouchard and colleagues [13] used videoconference to deliver cognitive behaviour therapy (CBT) to patients suffering from panic disorders with agoraphobia.

Participants received several sessions of CBT by trained therapists according to a standardized treatment manual. The remote site was located at 130 Km north of the local site and both were linked by ISDN lines. According to the authors, telepsychotherapy demonstrated statistically and clinically significant improvements of target symptoms (frequency of panic attacks, panic apprehension, severity of panic disorder, perceived self-efficacy) and measures of global functioning (trait anxiety, general improvement).

Furthermore, the authors noticed that a very good therapeutic alliance was built after only the first telepsychotherapy session [13].

13.2.2 Self-Help therapy

Self help material can be defined as any means (written, recorded etc.) whose content is a treatment program (or part of it) that may be self-administered by patients with or without the therapist's guidance [10]. The utility of self-help procedures has been acknowledged for a wide variety of psychological problems, like phobias, obesity, sexual dysfunctions and tobacco addiction. Scogin, Bynum, Stevens, & Calhoon, performed a meta-analysis review of 40 well designed outcome studies of self-help treatments [14]. The focus was on written or audiotaped material used by persons with various problems (bad habits, fears, depression, poor skills) without regular contact with a therapist or a teacher. The overall conclusions were that self-help is clearly more effective than no treatment at all and just as effective in most cases as treatment administered by a therapist.

Nonetheless, it has been remarked that there is a need of conducting more research in this area, in order to avoid indiscriminate use of self-help material which might even strengthen the problem rather than reduce it [15]. For instance, a person who self-applies an inadequate treatment may get the result of worsening the trouble instead of alleviating it. As noted by Botella [10], this risk depends on the fact that the information is offered in one go, that is, without taking precautions regarding whether every step along the therapeutic process is given in the appropriate way.

Useful self-help information can be found in books and on the Internet. Of course, the 50,000 self-help books published over the last 50+ years contain much more information than the current Internet, but the gap is narrowing [16]. In fact, the Internet is growing rapidly with more and more people getting access to free advice within seconds or minutes.

13.2.2.1 Online Self-Help groups

By the terms "on-line self-help groups", we refer to bulletin boards, chat rooms, news and discussion groups operated within health-related web pages, listservs (groups in which each individual message is copied and E-mailed to all subscribers), and other electronic forums focused on the sharing and solving of psychological disturbances [17]. Some are simply unstructured discussion groups, others are led by an individual (usually a nonprofessional) who shares the problem that the group addresses.

The last few decades have seen an enormous growth of self-help groups. The principle at the core of this approach is the sharing of experiences, strengths and hopes between members in order to solve their common problem. These groups offer both an alternative and adjunct to the traditional psychotherapy approach. A summary of what online self-help groups offer its members is provided by Madara [18]. Madara explains that social support, practical information, shared experiences, positive role models, helper therapy, empowerment, professional support, and advocacy efforts are all factors that operate online, just a they do in face to face groups [18].

The asynchronous nature of email online support groups provides the additional advantages of 24 hour availability, selective participation in entering and responding to messages, anonymity and privacy, immediate and/or delayed responding, and recording of transmissions. Members can save notes for later study, decide which sub-topics to engage in, and know that other group members are not judging them based on physical appearance [19]. According to Hsiung [20] the best option for online support is an online self-help group hosted by a mental health professional. In this way the mental health professional focuses on maintaining the supportive milieu and the members of the group focus on providing the support for each other.

In general the effectiveness of online self-help groups is high: different researches proved their efficacy as support tools in the treatment of eating disorders [21, 22], depression [23] and headache [24].

Nevertheless, as noted by Humphreys and colleagues [17] challenging ethical situations can arise for psychologists in Internet-based groups (p. 494):

- *Location*: on-line group members usually come from a broad geographical area, which makes it unlikely that a psychologist would be able to competently execute ethical responsibilities in the event of an emergency (e.g., a client residing in another state becomes suicidal);
- *Identity*: individuals cannot be reliably identified over the Internet. So, an individual with access to a client's computer (e.g., a family member or a coworker) could sign into on-line group psychotherapy by using the password and the name of the actual client.
- *Privacy*: because by definition everything "said" in Internet group therapy is typed, recorded, copied, and distributed, ensuring clients' privacy is difficult.

However, as underlined by these authors, future technological developments (e.g., improved encryption systems) and practical adjustments (e.g., restricting on-line group psychotherapy membership to local residents who can be screened personally before therapy begins) will help solving these problems.

13.2.2.2 Online Self-Help resources

In the following table, different services for seeking specific online self-help information and online support groups are summarized.

Table 13.1 Online Self-Help resources

Type of service	*Name of service*	*Web-Address*
Online support groups	Psychcentral Self-Improvement Online	http://www.psychcentral.com/mail.htm http://www.selfgrowth.com/newsgrp.html
Information about psychiatric diagnoses	Mental Health Net Psych Web Internet Mental Health American Psychiatric Association	http://mentalhelp.net/disorders/ http://www.psychwww.com/ http://www.mentalhealth.com/fr20.html http://www.appi.org/pnews/pnhome.html
Information about treatment methods	Internet Mental Health Psych Web Mental Health Net Knowledge Exchange Network	http://www.mentalhealth.com/ http://www.psywww.com/ http://mentalhelp.net/dxtx.htm http://www.mentalhealth.org/

13.3 The use of e-therapy in mental health care: The tools

Although these preliminary studies and applications of clinical telepsychology seem very promising, other aspects apart scientific and clinical issues are to be taken in account. As noted by Stamm [8] "Psychologists do not have to become technology specialists to be competent providers of telehealth services... However, to best know when and how to use technology to support healing... psychologists will need more technology proficiency, particularly with computers, than has been the norm. This is particularly true for those who will be establishing their practices in the coming decades." (pp. 536-537).

However, as showed by a recent survey on a sample of 213 Californian psychologists, only a fraction of psychologists is making use of computers for anything other than simple word processing [25]. Even though 52% of the samples were using their computer to maintain client financial records, only one in four who kept computerized client records were using office management systems designed for mental or medical health professionals. The rest were using general spreadsheets or word processing programs that did not have the capability to perform all functions required by a mental health practice.

In fact, in order to ensure appropriate development of mental telehealth applications, psychologists and other mental health professionals must have a clear understanding of the benefits and drawbacks (including costs) of different e-therapy tools, in order to choose the most suitable and convenient technologies to start with. In the next sections, these issues are examined in details.

13.3.1 Interaction modalities between client and therapist in telepsychotherapy

As compared to in-person therapy, telepsychotherapy is unique in how it offers the opportunity to use the computer to interact with clients via different pathways, each one having its advantages and drawbacks. These different interaction modalities are included in two distinct types of computer mediated communication (CMC): synchronous and asynchronous [26, 27]. Synchronous CMC is produced when communication occurs simultaneously between two or more users, as in any normal telephonic or face-to-face conversation. In synchronous communication, the client and therapist are sitting at their computer at the same time, interacting with each other at that moment.

Asynchronous CMC is produced when communication is not simultaneous. This means, simply stated, that there is a stretching of the time frame in which the interaction occurs.

The commonest form of asynchronous CMC is E-mail, in which a sender leaves a message in a receiver's electronic letterbox, which the receiver must open before he can read the message. Another more sophisticated type of asynchronous CMC is Newsgroup, an electronic notice-board on which users can post messages referring to a specific topic or area of interest. Users can read the messages by opening the notice-board, and send their own messages in turn. As with E-mail, there is no real-time link between the computers of the interacting subjects. Unlike asynchronous CMC, the most important feature of synchronous CMC is that it does provide a real-time link between users' computers [26].

Although the most frequently cited example is the video-conference, the most widespread system is in fact Internet Relay Chat, or IRC. IRC is a form of synchronous CMC which enables a group of users (a chat) to exchange written messages and interact with each other in two different ways, by sending a message either to a specified user, or to all members of the chat [27].

13.3.2 Pros and cons of synchronous and asynchronous CMC in telepsychotherapy

Suler [28] has analysed the pros and cons of synchronous and asynchronous communication in telepsychotherapy. Results of this evaluation are reported in the following table (13.2).

13.3.3 E-mail

E-therapy tools can be used to facilitate electronic communications between patients and care providers, typically in the form of electronic mail (e-mail). It could prove to be an effective mechanism for improving care and lowering costs because more frequent communications might enable better tracking of a patient's progress or eliminate the need for an office visit. As we have just seen, psychologists are already incorporating the use of E-mail into their professional activities.

Table 13.2 Pros and cons of different types of CMC according to Suler [28]

Type of CMC	Pros	Cons
Synchronous	• *The ability to schedule sessions defined by a specific, limited period of time;* • *A feeling of presence created by being with a person in real time;* • *Interaction may be more spontaneous, resulting in more revealing, uncensored disclosures by the client.* • *Making the effort to be with the person for a specific appointment may be interpreted as a sign of commitment and dedication;* • *Pauses in the conversation, coming late to a session, and no-shows are not lost as psychologically significant cues.*	• *The difficulties and inconvenience in having to schedule a session at a particular time, especially if the client and therapist are in very different time zones;* • *There is less "zone for reflection" - the time between exchanges to think and compose a reply – with the possible exception of lag, which offers a small zone for reflection* • *In the mind of the client, "therapy" may be associated specifically with the appointment and be less perceived as an ongoing, daily process.*
Asynchronous	• *There are no difficulties in having to schedule a specific appointment time; different time zones are not a problem;* • *There is the simple convenience of replying when you are ready and able to reply;* • *There is an enhanced "zone for reflection" that allows the therapist and client to think and compose a reply.*	• *The professional boundaries of a specific, time-limited "appointment" are lost.* • *There is a reduced feeling of "presence" because the client and therapist are not together in the moment.* • *Some of the spontaneity of interacting "in the moment" is lost, along with what spontaneous actions can reveal about a person.* • *There may be some loss of the sense of commitment that "meeting with me right now" can create.* • *Pauses in the conversation, coming late to a session, and no-shows are lost as psychologically significant cues (although pacing and length of replies in asynchronous communication may serve as cues).*

A representative survey of California psychologists in 1997 revealed that 36% used E-mail, a 50% increase since 1995 [5]. By using e-mail, various types of data (text, psychological tests, photographs etc.) can be stored in a computer and forwarded to another user. Equipment needs are minimal: a moderately fast computer and a connection to a network are adequate. In the e-mail therapy participants can use only the verbal channel because it is not possible to communicate with paraverbal or not verbal elements.

Emotions can be simulated, to some extent, by using symbolic or graphics expressions (i.e. the emoticons). According to Yager, [12] who has made a pioneering attempt to use e-mail in a clinical procedure, there are several reasons for which e-mail can be considered as a positive adjunct in therapy. Firstly, e-mail increases the frequency and amount of time contact with clinicians and therapeutic processes. Briefing feedback several times per week between sessions lets the patient know that the clinician is present, listening, and thinking about the patient. Secondly, the emotional value of e-mail is relevant because patients can initiate contacts when they feel most inspired and need most to be in contact with their clinician. A third factor is represented by the observation that quasi-daily e-mail reports require patients to be constantly aware of their behaviours and of being in therapy. Finally, e-mail can reduce the emotional burden of patients by encouraging and enabling them to say whatever they care to say. However, the use of e-mail as an adjunct in psychotherapy can have also some drawbacks. As underlined by Yager [12], potentially negative effects are:

1. Unwanted disclosures resulting from lack of privacy for receiving e-mail messages;
2. Clinician failure to respond in a timely and adequate fashion;
3. Clinician failure to recognize urgent and troubled communications meriting phone and/or face-to-face contact;
4. Inappropriate or excessive use of electronic messages.

As noted by Maheu and Gordon, [5], current findings regarding the use of E-mail by physicians suggest increasing utilization rates, although there is much debate about its clinical efficacy. For example, a recent study revealed that 69% of medical consultation requests by E-mail were limited to answering simple questions about particular symptoms, diagnostic tests, and therapeutic interventions [29].

13.3.4 Internet Relay Chat

The most widespread tool in psychotherapy for written synchronous communication is the Internet Relay Chat (IRC). As e-mail IRC allows more frequent patient-therapist communications, facilitating the tracking of a patient's progress and eliminating the need for an office visit [5]. IRC enables a group of users to exchange written messages and interact with each other in two different ways, by sending a message either to a specified user, or to all members of the chat. IRC has been successfully used by self-help organizations. The principle of the self-help group is that members are allowed to share experiences, strengths and hopes in order to solve their common problems. These groups offer both an alternative and adjunct to the traditional psychotherapy arena. They have in common the fact that members participate with the expectation of receiving emotional support and finding new ways to help themselves cope with their shared problems. By far the largest segment of these groups deal with substance abuse problems (i.e. Alcoholics Anonymous).

13.3.5 Video teleconferencing

Video teleconferencing (VTC) is considered by many as a synonym for telehealth [1, 6].

Simply stated, video teleconferencing allows participants to conduct visually interactive electronic meetings between one or more distant locations using video cameras, monitors and communications.

VTC can be a possible solution to limited rural mental health services [1, 6]. Especially in remote areas, patients tend to be under treated, receiving mental health services only in emergencies. Moreover, VTC can provide opportunities for clinical consultation, assessment, diagnosis, supervision, home health care, medication management, continuing education, and administrative review.

Patient acceptance in using VTC is high, even when individuals are acutely or chronically psychotic or agitated [1, 6]. This result is confirmed by the results obtained by Ghosh and colleagues [30], who found no differences in the therapeutic alliance when they compared 10 psychotherapy sessions conducted by video conference with 10 sessions conducted face to face.

Unlike conventional telephone communications, where parties are limited to only hearing each other, video teleconferencing utilizes both audio and video communications enabling participants to see and hear each other as if they were in the same room. VTC operates with a camera, a monitor and a computer processor. There are four basic types of VTC on the market:

1. dedicated VTC units;
2. desktop computer VTC units that pass data via telephone lines;
3. desktop computer VTC units that pass data via the Internet, and
4. retrofit units that use existing televisions and telephones.

A good measure of the quality of the unit is frames per second (fps): the faster the speed, the better the quality but, concomitantly, the higher the cost. The target is 30 fps (broadcast quality) but to keep costs down many units have a maximum of 15-20 fps, which allows fairly clear resolution as long as there is little movement. Determining appropriate speed (and price) should be based on the improvement over current clinical options and the clinical demands on the system [31]. For example, if it is important to see movement, as might be appropriate for seeing hearing-impaired patients who communicate by signing, higher frame rates are necessary. However, slower frame rates might be a better application in an underserved rural or frontier clinic where the choice is between no VTC and slower VTC. Slower frame rates are not a deterrent in situations where a still image is the most important clinical information. The next table provides an overview of the approximate costs per unit of different VTC systems along with the specification of transmission rate.

Tab. 13.3 Principal VTC systems and related costs

VTC type	Frame Rate (fps)	Price (per unit)
dedicated VTC	up to 30 fps	between $7,000 and $50,000
desktop computer VTC (telephone data transfer)	15 fps	$1,000-5,000
desktop computer VTC (Internet data transfer)	up to 30 fps	$100 and $500
Retrofit VTC	up to 20 fps	$350-500.

13.3.6 Shared Hypermedia Tools

Hypermedia can be described as "on-line setting where networks of multimedia nodes connected by links are used to present information and manage retrieval" [32]. While a hypertext consists of textual information in the first place, hypermedia include multiple information formats, such as visual, musical and animation elements. When hypermedia are used as communication tools, they are defined *Shared Hypermedia* [33, 34] tools (SHs).

SHs have the unique feature of integrating the communication potential offered by Internet with the richness of different multimedia contents. Different users, who are simultaneously browsing the same website, can communicate with each other and share files or web addresses. Furthermore, each user can get a constantly updated list of all the other online users who are visiting the same website [34]. Usually, a SH allows the user to conduct group and private chats, to exchange information and files, and even to share the same web-pages. On any website, SH users can see a list of other users and talk with them on group and private levels. SHs further enhances the user's experience by consolidating different forms of computer-mediated-communication (e-mail, IRC etc.) into one fully integrated interface. Many SHs also have a search engine that can be used to find a user who meets specific requirements (i.e. age, interests etc.). In this way, it is relatively easy for a therapist e.g. to set up a group with common interests, such as eating disorder or other mental illnesses. Some SHs have a feature called "web tour" that is very interesting for the possibility given to the therapist to provide patients who are not familiar with search/surf techniques in the Internet with relevant information tailored to their needs [34].

The next section provides a detailed description of the main features of most common SHs. In order to put the description of these software on a concrete basis, two possible scenarios are identified for their potential use in psychotherapy. According to the first scenario, the end-user (patient) can use a high-bandwidth internet connection (> 56 Kbps) and a middle/high-level PC workstation. According to the second scenario, the end-user can use only low-bandwidth internet connection (56 Kbps) and an entry-level workstation. For each scenario is provided a selection of the most suitable software along with an analysis of the application's technical specifications, the system's requirements, the estimated costs and the user-interface features. Furthermore, the main pros and cons of each application are discussed.

13.3.6.1 Scenario I: high-bandwidth connection (> 56 Kbps), middle-high level PC workstation

According to the first scenario, the end-user (patient) can use:

- A PC workstation equipped with a Pentium III-IV-Athlon (1.3 Ghz or better) processor or equivalent, at least 20 GB hard disk, at least 256 MB RAM memory, graphic card with at least 32 MB memory, full-duplex sound card (price: 2000-2500 Euros)
- A USB Web-Cam, headset, speakers, microphone (price: about 150 Euro);
- ISDN connection or faster (price variable depending on the Internet Service Provider)

This equipment supports the use of advanced (video) Shared Hypermedia Tools. As, we have seen before, these tools enable different users, who are simultaneously browsing the same website, to communicate with each other through audio/video conferencing and share files or web addresses. In the following section a description of the main features of these tools is provided, along with a critical evaluation of their functionalities and usability.

13.3.6.1.1 Microsoft NetMeeting 3.0

13.3.6.1.1.1 Developer and web-site

Microsoft Corporation (http://www.microsoft.com/windows/NetMeeting)

13.3.6.1.1.2 System's requirements

For Windows 95, Windows 98, or Windows Me, a Pentium II processor with 128 MB of RAM (recommended). ISDN, or LAN connection. Sound card with microphone and speakers (sound card required for both audio and video support). Video capture card or camera that provides a Video for Windows capture driver (required for video support).

13.3.6.1.1.3 Features

NetMeeting is a freeware shared hypermedia tool developed and distributed by Microsoft Corp. NetMeeting delivers a complete Internet conferencing solution for all Windows users with multi-point data conferencing, text chat, whiteboard, and file transfer, as well as point-to-point audio and video. The following features are supported by the release 3.0: Video/audio conferencing, Remote desktop sharing, Program sharing, Whiteboard, Chat, File Transfer and Advanced security setting.

13.3.6.1.1.4 Video/Audio conferencing

Using the feature of video/audio conferencing, the user can share ideas by talking with a remote user, send and receive real-time video images and send video and audio to a user who doesn't have video hardware.

13.3.6.1.1.5 Remote desktop sharing

Remote Desktop Sharing allows the user operating a computer from a remote location. Users activate the feature, then close NetMeeting - the feature doesn't work if NetMeeting is open. Remote sharing also only works with secure calls, and there is password protection.

13.3.6.1.1.6 Program sharing

Application sharing provides the ability to give control of a program to callers who don't have that program on their computer. Only one user can control an application at a time, and if "Controllable" appears in the title bar of the shared application, then callers know that the application is available for them to control. Other application sharing features include the ability to "unshare" specific programs or to "unshare" all programs, a feature for automatically accepting control requests or for requiring manual acceptance, and a “do-not-disturb” feature for temporarily disabling non-host control without actually switching the feature off. Users who have been granted control by the host can pass control to other users, as long as they are also using version 3.0, and the host can take control again at any time.

13.3.6.1.1.7 Whiteboard

With the Whiteboard, the user can review, create, and update graphic information, manipulate contents by clicking, dragging, and dropping information on the whiteboard with the mouse, cut, copy and paste information from any Windows-based application into the Whiteboard. Whiteboard pages can be saved and loaded in a second time, enabling the user to prepare information before a conference, then drag and drop it into the Whiteboard during a meeting.

13.3.6.1.1.8 Chat

Using the chat feature, the user can type text messages to communicate with other people during a conference and chat with one person or a group of people across multiple computers. The "Whisper" mode allows sending private messages with another person during a group chat session. The contents of the dialogue can be saved from the chat session to a file for future reference.

13.3.6.1.1.9 File Transfer

The feature “file transfer” enables the user to send a file in the background to conference participants. The file can be sent to everyone in the conference, or to one or more selected participants. The transferred files can be accepted or rejected.

13.3.6.1.1.10 Advanced security setting

Security is an important feature of NetMeeting 3.0. At the basic level, all calls can be secure or non-secure, which is the default setting. Options for secure calls include data encryption, certificate authentication, and password protection, but in secure calls, the audio and video options are disabled. In meetings, all calls are either secure or non-secure; calls between meeting participants can not be of different types. Another security option that's unique to meetings is the host's ability to limit what features participants can enact.

For example, meeting hosts can disable the right of anyone but themselves to begin any of the six main features (application sharing, text chat, audio, white boarding, file sharing, and video), and hosts can make themselves the only participant who can invite or accept others into the meeting. Hosts can also enable meeting names and - finally - meeting passwords.

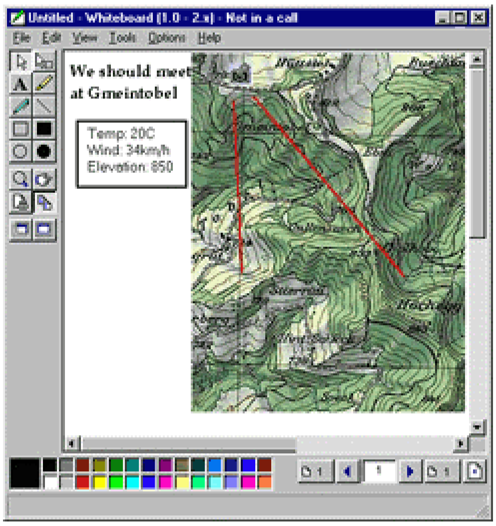

Fig. 13. 1 Screenshot of Netmeeting's Whiteboard

13.3.6.1.2 Paltalk

13.3.6.1.2.1 Developer and Web-Site
Paltalk (www.paltalk.com)

13.3.6.1.2.2 System's requirements
Windows 95/98/NT4/2000, Pentium 120 MHz, 64 MB RAM (recommended 128 MB), Internet Explorer 4.0, ISDN or LAN connection. Sound card with microphone and speakers, USB video camera.

13.3.6.1.2.3 Features
Paltalk is a freeware tool that combines the functionality of an instant messaging and internet telephony. The user can create his/her personal contacts-list and know who is online at any time. Anyone who has access to a PC and the Internet can make local and long distance calls for free, or simply chat with other people. The installation process is easy and does not require the user to fill in private information. The configuration wizard lets the user set the microphone in an intuitive way. Further features supported by Paltalk are the following:

13.3.6.1.2.4 Video/audio conferencing
Using the feature of video/audio conferencing, the user can share ideas by talking with a remote user, send and receive real-time video images and send video and audio to a user who doesn't have video hardware.

13.3.6.1.2.5 Voice mail
The user can record and send voice-mail messages. This feature is useful when the user is offline and another user is trying to contact him/her.

13.3.6.1.2.6 Hand rising
For moderated groups, the Administrator can control the microphone, and the participants can click the "raise the hand" to ask a question or add comments. This feature enables constructive discussions with a large number of people.

13.3.6.1.2.7 Group voice
The user can join ongoing group voice discussions or create a forum of his/her own.

In the next section some screen-shots of Paltalk are provided in order to illustrate the main features of this software.

13.3.6.1.2.8 Contacts list / Control Panel

The user can use this screen to access many of the features in Paltalk. For example, the user can see who is online and offline and can call them by double clicking on their name. The user can also see a group list by clicking on the Groups button.

13.3.6.1.2.9 One-to-One Video Screen

This is the screen used to communicate with another Paltalk user. The interface enables text chat, voice or video communication.

13.3.6.1.3 Eyeball chat

13.3.6.1.3.1 Developer and Web-Site

Eyeball Networks (www.eyeball.com)

13.3.6.1.3.2 System's requirements

Windows 98, ME or 2000; Microsoft DirectX 7.0, Pentium 166 MHz, at least 64 MB RAM (128 MB recommended), Internet Explorer 4.0, ISDN or LAN connection. Sound card with microphone and speakers, USB video camera.

13.3.6.1.3.3 Features

Eyeball is a shared hypermedia tool that enables distance communication by using different channels, as video, audio and text messages. The quality of video is high, even using a slow internet connection. Another interesting feature of this software is the user-friendliness of the interface, which requires a relatively short learning time. Eyeball chat can be used either as video-chat or video-messenger communication tool. This last feature allows the user to send and receive video-messages and it is useful especially when the other users are temporarily offline.

Fig. 13.2 Screenshot of Eyeball's main menu

Furthermore, the software enables the user to optimise the configuration of the hardware supporting video communication. In fact, it is possible to give more or less weight to the image quality, frame-rate and audio fidelity, so that each user can define the most suitable configuration according to his/her needs. The video quality is dynamically and automatically optimised according to the bandwidth and the computational power available at any moment. The contacts list shows the users online, who can be directly contacted by selecting their nickname with the mouse. The graphic interface can be positioned everywhere in the screen and overlapped to other applications. This makes it possible to keep on working with other applications during the chat-session. Moreover, the web-version of the software allows the user to begin a chat session directly from the web browser. This feature is useful, for example, when the user needs to access the service from other locations. Of particular interest, finally, is the group video chat. The group video chat enables multiple users to share ideas and sending and receiving real-time video images.

13.3.6.2 Scenario II: slow bandwidth, entry-level workstation.

According to the second scenario, the end-user (patient) has:

- A PC workstation equipped with at least a Celeron 800/Pentium III 800/Duron 800 processor, 10 GB Hard Disk, graphic card with at least 16 MB memory, sound card, at least 64 MB RAM memory (price: 700-1000 Euros)
- Headset, speakers, microphone (price: about 50 Euro);
- 56 Kbps internet connection.

This equipment supports the use of simple (text/voice) Shared Hypermedia Tools. The tools most suited to this equipment are the *Instant Messengers (IM)*. These applications have one common feature: they allow users, who are simultaneously online, to send each other's text messages in real time. From a technical point of view, the underlying mechanism is the same: after the connection to the internet, the user is assigned with a numerical address. Then the software connects to its own network and communicates the system which IP address has been assigned to the user. In this way, a direct connection between two users is enabled.

Most IMs provide the user with the option to decide his/her *status* (i.e. online, offline, away, etc.) and the degree of privacy he/she wishes to maintain. In this way, one can either communicate with the users who are included in the contacts list, or be visible to all users of the network. If compared with standard e-mail client applications, the added value of the IMs is that such applications enable the users to know whether friends or colleagues are simultaneously online and, in this last case, to communicate with them instantaneously.

Another common feature of most IMs is represented by their low complexity. In fact, these software can be easily integrated both in the desktop (by an icon in the system tray) and in other software. Actually, such tools are conceived primarily to remain active while the user keeps on working with other applications.

In order to evaluate the potential of the IMs for a clinical application, issues such as user-friendliness, simplicity of use, facility of contacts management, compatibility with other systems, richness of features and network's stability are examined in detail.

13.3.6.2.1 AOL Instant Messenger

13.3.6.2.1.1 Developer and Web-Site
America Online Corporation (http://www.aol.com/aim)

13.3.6.2.1.2 System's requirements
Internet Explorer 4.5, Internet connection, Pentium I processor or higher, 16 MB RAM, 5 MB Hard Disk, sound card with microphone and speakers, Windows 95, 98, o NT, Microsoft Virtual Machine.

13.3.6.2.1.3 Features

The interface of this IM is represented by an icon in the system tray and a window, which displays the contacts list. The contacts list can be easily organized by categories. A useful feature is the possibility to check new e-mail messages on multiple accounts, which can be set in the "general options" panel. In addition, AIM can automatically check the incoming mail and the user is informed as soon as a new e-mail message is downloaded. Other communication features are:

- sending and receiving e-mail messages;
- text chat;
- voice chat;
- telephone calling over IP (PC to PC and PC to telephone)

There is also an "express" version of AIM available, which can be loaded from the web browser. The main cons of AIM are that this IM comes with few features and that its user interface is too essential.

13.3.6.2.2 ICQ

13.3.6.2.2.1 Developer and Web-Site

Icq Inc. (www.icq.com)

13.3.6.2.2.2 System's requirements

Internet Explorer 4.5, Internet connection, Pentium I processor or higher, 8 MB RAM, sound card with microphone and speakers, Windows 95, 98, o NT.

13.3.6.2.2.3 Features

ICQ is a widespread IM with over 100 million downloads since its launch, five years ago.

The program's kernel is the messages management system, which is represented by the classic icon in the system tray. The messages management system is linked to the control panel, which collects the main features of the application. The control panel can be displayed in two modalities: *advanced* and *simple*.

The *simple* modality displays the basic features only, which are the *contacts list* and *messages management*. The *advanced* modality allows the user to configure his/her *status*: online, offline, standby, etc. A sound and a flashing icon announce the incoming messages.

Further features provided by this application are: sharing file and web-addresses, sending and receiving e-mail messages, sending chat request, sending contacts list, voice chat and telephone over IP. ICQ represents an effective choice especially for those users who need to efficiently coordinate the communication between many people, especially if they are working in different geographical locations. Furthermore, ICQ provides the web-site administrators with the opportunity to include in the home page a real communication centre, which allows the visitor to contact the web-site administrator in real time. In conclusion, ICQ is a very interesting application, rich of features and well organized. The main drawback of this software is represented by the user interface, which is a bit complex and not easy to learn, especially for novices.

13.3.6.2.3 MSN Messenger

13.3.6.2.3.1 Developer and Web-Site

Microsoft Corporation (www.msn.com)

13.3.6.2.3.2 System's requirements

Internet connection, Microsoft Internet Explorer 4.0, Netscape Navigator 4.0, Pentium I processor or higher, full-duplex sound card with microphone and speakers, 8 MB RAM, 2 MB Hard Disk, Windows 95, 98, Me, 2000, NT 4.0.

13.3.6.2.3.3 Features

MSN Messenger Service is an easy way to take advantage of the full power of instant messaging. It is a simple, not invasive application that allows the users to exchange messages with friends or colleagues, but only if they are also registered users. The range of services offered by this IM is reduced to the minimum, and consequently the user interface results very simplified. Installing MSN is easy: on Windows 98, the entire program installs in just a few seconds, even while several applications are open, and it requires just one reboot. The MSN icon, always active in the system tray, indicates the *status* of the user (online, offline, busy, away etc.) and when the icon is double-clicked a window pops up and displays the contacts list. The window is the kernel of MSN, and it allows the user to manage the contacts list, to change *status* and to check the incoming mail. The incoming messages are automatically announced by a sound and by a small-sized window that pops out and provides a brief description of the message's features. Further features of MSN are:

- searching contacts by using Microsoft Passport™
- sending instant messages
- sharing file
- telephone over IP
- voice chat
- sending SMS (this service is limited to devices registered at msn.com)

In conclusion, MSN messenger is well-suited for a professional use, thanks to its simplicity and its high stability.

13.3.6.2.4 Odigo

13.3.6.2.4.1 Developer and Web-Site

NovaWiz (www.odigo.com)

13.3.6.2.4.2 System's requirements

Internet connection, Pentium I processor or higher, full-duplex sound card with microphone and speakers, Windows 95, 98, Me, 2000, NT.

13.3.6.2.4.3 Features

Odigo is a IM application easy to use and features-rich. Installing Odigo is easy and the installation can be customized, so that the user can choose which features are to be downloaded. The registration process is included in the installation, and it does not require to exit from the wizard. An icon placed in the system tray represents the basic interface.

Double-clicking on this icon can activate the control panel. The appearance of the window of the control panel can be customized and the user can choose between several different *skins*. An unique feature of Odigo is the possibility to define the "mood": in fact, the user can choose the *emoticon* that fits best according to his/her current mood (i.e. happy, tired, bored, etc.). Odigo's kernel is represented by the *Communication Centre*, the dialog window that allows the management of the messages and of the other communication options.

Fig. 13.3 Screenshot of Odigo

The *Communication Centre* is divided in two parts. The upper part tracks the text of the dialogue, while messages are written in the lower part. The *Communication Centre* is also the control panel of the other program's features, which include file sharing, text/voice chat, and co-surf. This last characteristic of Odigo is very intriguing, because it allows two or more users to co-surf simultaneously in the same web-site. Furthermore, Odigo can be interfaced with other IMs (ICQ, AIM, Yahoo Messenger) by downloading and installing the appropriate plug-ins. However, a drawback of this application is that the user is burdened by communication requests coming from all over the world, and there is no way to reduce the visibility to the rest of the community. Another drawback is that the Odigo displays continuously commercial banners tailored to the user's profile.

13.3.6.2.5 Yahoo Messenger

13.3.6.2.5.1 Developer and Web-Site

Yahoo Inc. (http://messenger.yahoo.com)

13.3.6.2.5.2 System's requirements

Internet connection, Pentium I processor or higher, full-duplex sound card with microphone and speakers, Windows 95, 98, Me, 2000, NT.

13.3.6.2.5.3 Features

Yahoo Messenger is a very simple application full integrated with the services of the web-portal yahoo.com. The installation process is easy but requires the registration to the Yahoo! services. YM offers two different modalities of use of its services: the YM *window*, which gives access to all the application's tools, and the YM *browser*, which is direct linked with all the services offered by the web-portal yahoo.com. The application allows the user to create and to organize a personal contacts list, which can be upgraded at any time. To add new contacts to the list, there is a search tool integrated into the web-portal that offers advanced search options, i.e. searching a new contact by name, by keyword or simply by nickname. The incoming messages are automatically announced by a sound and by a small-sized window that pops out and provides a brief description of the message's features. The communication features include text chat and voice mail.

Tab. 13.4 Synoptic chart of software features, system's requirements and usability

Software	Features	Usability	System's requirements
NetMeeting	▪ Video/audio conferencing; ▪ Files/programs sharing; ▪ Desktop sharing; ▪ Whiteboard; ▪ Text chat.	User interface: easy Learning rate: fast	Win 95, Win 98, or Win Me, Pentium II processor with 128 MB of RAM (recommended). 10 MB of free hard disk space, ISDN or LAN connection. Sound card with microphone and speakers. Video capture card or camera that provides a Video for Windows capture driver (required for video support).
Paltalk	• Video/audio conferencing; • Voice mail; • Text chat; • Voice chat.	User interface: easy Learning rate: fast	Win 95/98/NT4/2000, Pentium 120 MHz, 64 MB RAM (recommended 128 MB), Internet Explorer 4.0, ISDN or LAN connection. Sound card with microphone and speakers, USB video camera.
Eyeball chat	• Video/audio conferencing; • Group video conferencing; • Video mail; • Text chat.	User interface: easy Learning rate: fast	Win 98, ME or 2000; Microsoft DirectX 7.0, Pentium 166 MHz, at least 64 MB RAM (128 MB recommended), Internet Explorer 4.0, ISDN or LAN connection. Sound card with microphone and speakers, USB video camera.
AOL Instant Messenger	• E-mail; • Text chat; • Voice chat; • Telephone over IP.	User interface: easy Learning rate: fast	Internet Explorer 4.5, Internet connection, Pentium I processor or higher, 16 MB RAM, 5 MB Hard Disk, sound card with microphone and speakers, Windows 95, 98, o NT, Microsoft Virtual Machine.
ICQ	• File sharing; • E-mail; • Text chat; • Contacts list sharing; • Voice chat; • Telephone over IP; • SMS.	User interface: complex Learning rate: slow	Internet Explorer 4.5, Internet connection, Pentium I processor or higher, 8 MB RAM, sound card with microphone and speakers, Windows 95, 98, o NT.
MSN Messenger	• File sharing; • Telephone over IP; • Voice chat; • SMS.	User interface: easy Learning rate: fast	Internet connection, Microsoft Internet Explorer 4.0, Netscape Navigator 4.0, Pentium I processor or higher, full-duplex sound card with microphone and speakers, 8 MB RAM, 2 MB Hard Disk, Windows 95, 98, Me, 2000, NT 4.0.
Odigo	• File sharing; • Text chat; • Contacts list sharing; • Voice chat; • Web co-surf; • SMS.	User interface: easy Learning rate: slow	Internet connection, Pentium I processor or higher, full-duplex sound card with microphone and speakers, Windows 95, 98, Me, 2000, NT.
Yahoo Messenger	• Voice mail; • Text chat; • Organizer; • File sharing.	User interface: easy Learning rate: fast	Internet connection, Pentium I processor or higher, full-duplex sound card with microphone and speakers, Windows 95, 98, Me, 2000, NT.

Tab. 13.5 The audio/video quality of the software has been assessed by using an Acer Travelmate 521TE, OS Win. 98, equipped with ATI Rage 8 MB AGP video card, full-duplex sound card, 128 MB SDRAM memory, Pentium III 800 MHz processor. Quality rates (1 = low; 2 = acceptable; 3 = high) are strictly related to the available bandwidth.

Software	Bandwidth	Audio Quality	Video Quality
NetMeeting	< 56 Kbps	2	1
	> 56 Kbps	3	2
Paltalk	< 56 Kbps	1	1
	> 56 Kbps	2	2
Eyeball Chat	< 56 Kbps	1	2
	>56 Kbps	1	3
AOL Messenger	< 56 Kbps	1	-
	> 56 Kbps	2	-
ICQ	< 56 Kbps	1	-
	> 56 Kbps	3	-
MSN Messenger	< 56 Kbps	2	-
	> 56 Kbps	3	-
Odigo	< 56 Kbps	2	-
	> 56 Kbps	3	-
Yahoo Messenger	< 56 Kbps	1	-
	> 56 Kbps	2	-

Finally, an interesting characteristic of YM is the virtual organizer, which can be used to schedule activities and to fix appointments. The virtual organizer can be shared with other users by selecting them in the contacts list.

In conclusion, YM is a very effective shared hypermedia tool particularly suited for workgroups. The main drawback of YM is the lack of the voice chat, which has become a standard feature in most IMs.

13.4 The use of e-therapy in mental health care: The possible future

13.4.1 How to integrate shared hypermedia in the clinical procedure

Taken together, the results of this review suggest that shared hypermedia are well-suited for a telemedicine application in psychotherapy [33]. However, the real effectiveness of such tools depends largely on the ability of therapists to coherently integrate the features of SHs in the clinical procedure.

For this reason, it would be useful to provide the reader with some insights regarding potential ways of using SHs in psychotherapy. The following considerations are not meant to be exhaustive, rather to stimulate the creativity and the curiosity of mental health professionals who are particularly interested in promoting new solutions for using Internet related technologies in the clinical practice.

By using SHs, the therapist and the patient are able to share pictures, screenshots and videos captured by a video camera installed on their workstations and to communicate their ideas and impressions using both the text chat and voice chat features. The "application sharing" feature enables the therapist to send to the patient a psychometric questionnaire for assessment purposes and receive the result in real time. Consequently, the therapist is able to provide the patient with a feedback in a fraction of the time that this process normally requires.

Remote desktop sharing is a powerful new feature which, when perfected, could allow the therapist to help novice patients to configure their system remotely. The "virtual whiteboard" is another interesting feature that has promising applications. For example, the therapist can use the whiteboard to enrich his/her explanations with diagrams and drafts, which can be exported to other applications. Finally, the text-chat feature allows the therapist to save the content of the dialogue as text file, making it available for future reference.

Less complex SHs (IMs) represents an acceptable compromise between simplicity of use and richness of communication features. Although few exceptions, IMs have a very intuitive and easy-to-learn interface. This last feature is very important, because it makes IMs well-suited also for end-users who are not very familiar with Internet technologies.

Another advantage of most IMs is that therapist can send the patient a request for a communication session using either the IM feature (if the patient is online and logged in) or the e-mail. Once the session is open, the therapist can chat with the patient privately or in group, by sending a request to the other patients that are online at that moment. In some IMs, the users can rapidly move from the text chat to the voice chat, which has often a valuable quality even if the users are using a slow connection (56 Kbps). Furthermore, even using simple IMs applications the therapist is able to send the patients files (i.e. assessment questionnaires) and to receive the results even within the same session.

13.4.2 How to evaluate the effectiveness of Shared Hypermedia as Telemedicine tools

The clinical effectiveness of telemedicine tools can be measured and compared at several levels. In fact, it is possible to look for effects on the process care or for effects on the outcomes of care or both [3]. Fineberg and colleagues [48] distinguish several process and outcome dimensions that might appropriately be assessed by evaluators. According to these authors, these dimensions include:

- Technical capacity – whether a technology is safe, accurate, and reliable;
- Diagnostic accuracy – whether a technology contributes to a correct diagnosis;
- Diagnostic impact – whether a technology provides diagnostic information that is useful in making a diagnosis (e.g., after the telemedicine consult, is face-to-face consultation still necessary?);
- Therapeutic impact – whether a technology influences patient management or therapy;
- Patient outcome – whether a technology improves patients' health and well-being.

Could the clinical effectiveness of SHs be assessed by using such dimensions? In order to answer this question, a point-to-point analysis is needed.

Technical capacity

The technical capacity of SHs is well demonstrated. In fact, these software are developed for commercial purposes and are conceived for massive distribution (actually most of them are freeware or shareware) over the Internet. They are first intended to be effective, safe, accurate and reliable communication tools. Their success - and that of the developer - depends primarily on these aspects, including human-interface and ergonomic issues. Of course, there are some differences concerning the degree to which each particular SH meets these requirements (i.e., not all SHs have a user-friendly interface).

Diagnostic accuracy and diagnostic impact

This issue is strictly dependent on the type of hypermedia that the mental health professional might choose. However, there are boundaries to the accuracy with which SHs can be used for diagnostic purposes. Despite of the great range of communication features that characterize most of these software, they can not remotely convey the richness of information (verbal and non verbal) provided by direct, face to face (f2f) interaction. The real challenge for SHs is to allow the remote reconstruction of the clinical setting.

Therapeutic impact

The therapeutic impact of SHs could be very significant. In fact, such tools have the potential to influence both patient management and therapy. This forecast is supported by the observation that simpler Internet-related technologies (i.e. e-mail or text-chat) have significantly and positively affected the outcomes of mental health sessions [e-mail in eating, etc].

Patient outcome

Up to now, the majority of programs that have applied Internet related technologies for the treatment of mental disorders have encountered positive, if not even enthusiastic, reactions by patients. This is not sufficient, of course, to demonstrate whether this technology (and related ones, like SHs) can really improve patients' health and well-being. To our knowledge, the only ongoing project that is currently experimenting SHs-based telemedicine solutions for clinical psychology is the EU-funded VEPSY Updated (Telemedicine and Portable Virtual Environments for Clinical Psychology) project (IST-25323 – http://www.vepsy.com). However, there are several studies in different therapeutic areas that reported significant improvements of patient who were included in Internet-supported therapy programs [Yager, Murdock, King e Moreggi]. So, although there is still a lack of experimental and clinical outcomes evidencing the effectiveness of SHs in psychotherapy, these preliminary results are encouraging.

13.5 Conclusion

The emergence of e-therapy could have a strong effect on mental health care. As we have seen, the key characteristic of e-therapy is the use of shared media. Using the Internet, therapists can present, from a remote site, a wide variety of stimuli and to measure and monitor a wide variety of responses made by the user. In the near future psychotherapists will probably use e-therapy tools that support advanced communicational features like real time video connections, audio, exchange of text and video messages etc. From this point of view, shared hypermedia tools represent the evolution and the natural candidate to replace email and telephone, which are currently the most widespread telehealth tools [33].

However, at this stage, there are different short-comings that delimit the potential of this approach. The main problem is non-technical and is related to the personal and organizational changes needed to introduce e-therapy in healthcare organizations [35].

Although the introduction of shared media has been successful and become accepted practice in many areas of industry, traditional methods have tended to prevail in health-care. Telehealth and e-therapy have been adopted by enthusiasts who recognize the potential benefits of a these new media. However, the more widespread introduction of e-therapy requires considerable organizational change in the way health-care is delivered [36]. This requires a modification of established factors such as consultations and referral patterns, ways of payment, specialist support for primary healthcare, co-operation between primary and secondary healthcare, defining geographical catchment areas and the "ownership" of the patients [37].

A further problem is the technology of e-therapy. Actual technology – hardware, software and transmission – is far from perfect [38]: insufficient image quality, low framing rate, flickering and delays makes working in front of a video terminal unattractive and in particular very tiring.

Fortunately the quality of technology in this area is increasing while costs are falling down.

Prices are declining by about 25 per cent per year [39]. Simple telephone-based videoconferencing system are now available for under $500 while high quality board-based ISDN systems can cost less than $1000. New transmission technologies, including Digital Subscriber Line (xDSL) and cable modem, promise to provide order-of-magnitude increases in dependable bandwidth for a small increment of price. For the success of e-therapy applications widespread access to the Internet is also required. Many applications currently demand only moderate bandwidth and latency, meaning that standard modem access to the Internet, at 28.8 to 56 kbit/s may suffice.

A recent research evaluated a low-bandwidth e-health system in eight community hospitals connected to a central hospital via the Internet. PCs were used with videoconferencing software and modem connections to the telephone network. Even if the average live video frame rate was 1 frame/sec. (at the best image quality), with an average latency of 3 seconds, the results suggested that Internet-based videoconferencing is acceptable for certain telemedicine applications [40]. Successful results with a limited bandwidth have also been obtained by an e-health teleconsultation application developed in Croatia: a 33 kbit/s link was established between a team of specialists in the General Hospital 'Sveti Duh' in Zagreb and a general practitioner's clinic in Selca, on the island of Brac using $700 computer systems [41]. Another relevant issue is that of ensuring equitable access to health resources by different demographic groups. There are already considerable differences in access to health care in the world. Ensuring that differential access to the Internet along demographic lines does not exacerbate this imbalance could become an increasingly important issue, especially if the provision of health care moves online [42].

Security and legal protection are two more key issues for the diffusion of e-therapy [43, 44]. In fact this approach involves three fundamental types of relationship [45] in which a duty is owed by one party to another: the relationship between the clinician and the patient, the relationship between clinicians and the relationship between the provider of the telemedicine system and the user. The situation may be complicated by the involvement of multiple clinicians and/or the providers of the telemedicine systems (call centres, telecommunications network, etc). As noted by Stanberry [45], if “a patient is harmed during a teleconsultation (the healthcare centre) could choose to name a number of these organisations or individuals as defendants to a legal action for negligence if it is unclear what went wrong or where responsibilities are” (p. 24). Moreover e-therapy can hide severe privacy and security risks, because patient data and hospital data stored on a secure Intranet can be manipulated by connecting it to the Web. This is even truer for e-mail consulting. Most e-mail exchanges between patient and provider involve discussions of personal health information, which must be suitably protected from breaches of confidentiality and, to a lesser extent, alteration [46]. However the establishing of a firewall and the introduction of HPC (Health Professional Card) can drastically reduce the risk of un-authorized access to the hospital server. For secure e-mail, PGP (Pretty Good Privacy) can be easily used as a standard protocol [43]. In general, planning all activities exactly as well as introducing advanced form of data protection are important requisites for reduction of security risks in Internet [47].

To spread the diffusion of e-therapy, further research is needed. More evaluation is required of clinical outcomes, organizational effects, benefits to health-care providers and users, and quality assurance. The absence of empirical research at this time makes it impossible to objectively evaluate the benefits and the efficacy of e-therapy [5]. Each Internet technology requires thoughtful and flexible research, legislation, and ethical guidelines to make it safe and effective as a service delivery vehicle. As clearly underlined by Maheu and Gordon, “it is crucial for professional psychologists to give proper attention to empirical research and current standards of practice before attempting to deliver counselling or psychotherapy via the Internet" (p. 489). It is also very important that professionals in this field share information about their experience and examine the results of evaluations so that the suitable development work can be speeded up.

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