REVIEW ARTICLE

Telepsychiatry: Promise, potential, and challenges

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ABSTRACT

Despite the high prevalence and potentially disabling consequences of mental disorders, specialized mental health services are extremely deficient, leading to the so-called 'Mental Health Gap'. Moreover, the services are concentrated in the urban areas, further worsening the rural–urban and tertiary primary care divide. Strengthening of and expanding the existing human resources and infrastructure, and integrating mental health into primary care appear to be the two major solutions. However, both the strategies are riddled with logistic difficulties and have a long gestation period. In such a scenario, telepsychiatry or e-mental health, defined as the use of information and communication technology to provide or support psychiatric services across distances, appears to be a promising answer. Due to its enormous potential, a review of the existing literature becomes imperative. An extensive search of literature was carried out and has been presented to delineate the modes of communication, acceptability and satisfaction, reliability, outcomes, cost-effectiveness, and legal and ethical challenges related to telepsychiatry. Telepsychiatry has been applied for direct patient care (diagnosis and management), consultation, and training, education, and research purposes. Both real-time, live interaction (synchronous) and store–forward (asynchronous) types of technologies have been used for these purposes. A growing amount of literature shows that training, supervision, and consultation by specialists to primary care physicians through telepsychiatry has several advantages. In this background, we have further focused on the models of telepsychiatry best suited for India, considering that mental health care can be integrated into primary care and taken to the doorstep of patients in the community.

Key words: E-mental health, mental health gap, telepsychiatry

INTRODUCTION

Information and communication technology (ICT) has percolated into various aspects of life through its varied applications; education, banking, business management, to name a few of these areas. Over the last couple of decades, advancements in ICT have been aptly utilized in the field of health care also, for example, maintenance of electronic medical records. Another and probably more promising application of ICT is its use for delivery of health care to remote and inaccessible areas – telemedicine. Telemedicine is defined as the practice of medical care using interactive audio, visual, and data communications.[1] All over the globe including both developed and developing nations, various programs for health care delivery and education through telemedicine have been implemented. These programs cover various disciplines of medicine such as radiology, dermatology, pathology, systemic medicine, ophthalmology, and psychiatry. Some are focused on home-based care for specific disorders such as diabetes, cardiac conditions, etc., Of these, telepsychiatry is considered as the most active application of telemedicine in the Western world.[2] However, in the developing nations, telepsychiatry is still in its infancy stage and exists more as an off-shoot of telemedicine, rather than an independent service. The field of psychiatry is unique when compared

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to other specialties of medicine, as human interaction and client–therapist relations are integral to its practice. Hence, whether or not psychiatry renders itself to this mode of service delivery (tele-services) has been highly debated.

Telepsychiatry, also termed as telemental health or E-mental health, is broadly defined as the use of ICT to provide or support psychiatric services across distances. The use of technology in the mental health field has been noted sporadically since the sixth decade of the last century; for example, use of closed circuit, two-way television for routine clinical and educational purposes,[3-5] use of telephone to provide emergency care, etc. Over the last two decades, there has been a growing interest in delivering mental health care and mental health education by means of progressively advanced technologies. Using advanced technologies, mental health professionals can render their expert services to patients in far reach areas, and also provide specialist consultation to the primary care providers in the rural areas. Such technology has been used for psychiatric consultation, assessment, and diagnosis, medication management, and management by individual and group psychotherapy. In addition, telemental health has been used for the purposes of education, storage, and accessibility of medical data and research.

PROMISE OF TELEPSYCHIATRY

The greatest promise of telepsychiatry is providing a feasible alternative for the existing and grossly scarce mental health services. The health systems around the world are grappling with huge numbers of persons with mental disorders who require professional care and extremely small numbers of mental health care providers. Epidemiological studies across the world have shown that mental health disorders are highly prevalent with some estimates as high as lifetime prevalence of 49% in the adult population.[6] Even the older studies such as NIMH-Epidemiological Catchment Area study[7] done in the US reported lifetime prevalence of psychiatric morbidity of 322/1000 population. Epidemiological studies conducted in India report varying prevalence rates, ranging from 9.54 to as high as 370 per 1000 population.[8] The two major meta-analyses from India place the prevalence rates at 58.2 per 1000 general population[9] and at 73 per 1000 general population, with a rural morbidity at 70.5 and urban morbidity at 73 per 1000.[10] It has been further asserted that the prevalence of mental disorders reported in epidemiological surveys can be considered lower estimates rather than accurate reflections of the true prevalence in the population.[8] Despite the high prevalence of mental disorders in the community and recognition of the ensuing disability due to these disorders placing these in the first 10 major illnesses contributing to the disability-adjusted life years, service provision for their diagnosis and management is appalling. In 2002, the mental health resource mapping in India revealed that 2219 psychiatrists were available nation-wide,[11] while the more recent estimates put the figure at 2800 – a dismal marginal increase. This is in stark contrast to the estimated requirement of 9696 professionals.[12] The number of psychiatrists, psychiatric nurses, psychologists, and social workers are 0.2, 0.05, 0.03, and 0.03 per 100,000 population, respectively, and the total psychiatric beds are 0.25 per 10,000 population.[13] Only 29% of mental health needs are met by the available manpower. Furthermore, this small scale of infrastructure and human resources are unequally divided with huge urban–rural discrepancies.[13] Most mental health care is based in institutional settings and not in community setting. Moreover, there is no link between the tertiary care and the primary care. People living under socioeconomic deprivation have the highest need for mental health care but lowest access to it, thus further compounding the mental health gap.[14]

Such a gross mental health gap appears to be insurmountable in the near future with measures such as expansion of existing resources (increasing the number of training institutes and upgrading and strengthening the existing ones, increasing psychiatric training component during under-graduate course, and training of primary health care workers) alone as these have practical difficulties in implementation and have a long gestation period. At this juncture, with the multiple problems of unmet needs, scarce resources, urban–rural and tertiary and primary care divide, and no easy and tangible solutions, the ongoing technological advancements in India (India being considered an information technology giant) are a blessing. Appropriate use of technology for delivering mental health services can be a turning point in the mental health care system.

Hence, it becomes imperative that we review and apprise ourselves with the existing developments, shortcomings, and challenges in the field of telepsychiatry and debate its potential in our setting. For this purpose, we have extensively reviewed the existing literature on telepsychiatry/tele-mental health. Though telepsychiatry in its broader sense includes various technologies utilized for the purpose of delivering mental health at a distance, the literature has focused more on video-conferencing as a mode of communication. Such an approach hinders exploring other existing technologies which might prove to have more utility in a variety of settings. Keeping in mind these limitations, we have initially presented the modes of communication used in telepsychiatry followed by a more comprehensive review of the literature including studies using different technologies, though as mentioned earlier, literature appears to be biased in favor of video-conferencing. For the review of literature, the keywords 'telepsychiatry,' 'tele-mental health,' 'telemedicine,' 'video-conferencing' and 'psychiatry,' 'internet' and 'psychiatry,' 'electronic mail/e-mail' and 'psychiatry,' 'synchronous,' 'asynchronous,' 'feasibility,' 'acceptability,' 'satisfaction,' 'reliability,'

'clinical outcome,' and 'cost-effectiveness' were used in various combinations. We included review articles and meta-analyses besides individual studies. We excluded studies that did not describe the delivery of educational, clinical, or supervisory services through any mode of telepsychiatry (pertained mainly to 'internet' and 'e-mail').

MODES OF COMMUNICATION

Use of telephone (for consultation, crisis management, psychotherapy, referral), cell phone text messaging, and two-way closed circuit television have been integral in telepsychiatry communication, and are precursors to the more sophisticated and latest distance technologies applying the internet. E-mail, instant messaging, online chat forums, professional advice via websites and blogs are amongst the different ways in which internet has been used. Online and virtual chat rooms offer a forum where people interact with others including mental health professionals and share their experiences. With advancement in technology, video-conferencing has become an important modality in the field of telepsychiatry as it permits live, two-way interactive, full-color, simultaneous video, audio, and data communication.

Overall, there are two main types of communication technologies: Synchronous or interactive and asynchronous or store and forward.[15] Synchronous services provide live, two-way interactive transmission between patient and provider at distant locations. The interactive forms of communication include telephony, online communication (e.g., chat forums), and video-conferencing, and these have the advantages of real-time interaction whereby response is immediate. Thus, provision of services through synchronous communication mimics face-to-face interviewing and treatment, though its quality is limited by the quality of the technology used. However, with improving technologies, the quality of audio and video real-time interaction has improved. Store-and-forward mode of communication involves acquiring medical data and then transmitting this clinical information via e-mail or Web applications for later review by a specialist. As against synchronous forms of communication, asynchronous communication involves non-real time or 'store and forward' interaction and does not require the presence of both parties at the same time. The information can be transferred in the form of data, audio, video clips, or recordings. E-mail is the most commonly used form of asynchronous communication in telemedicine services and has the advantages of being relatively inexpensive and does not need any extra or special hardware support. Also, it is readily available at various locations.

SCOPE AND POTENTIAL OF TELEPSYCHIATRY

Telepsychiatry has been applied for direct clinical case management, education, and consultation–supervision. An extensive review of literature in the field of telepsychiatry brings forth the evidence for feasibility, efficacy, and effectiveness of this approach of health care delivery. Earlier documented work chiefly consisted of program descriptions and demonstration of novel clinical applications in a limited number of patients. Most of these latter studies were limited by methodological weaknesses, and provided qualitative data rather than quantitative data. Despite these shortcomings, each study represented an important step taken toward exploring the potential of e-mental health. Over the last decade, there has been a growing interest in this field and there have been some non-randomized and randomized controlled trials comparing clinical outcomes of patients enrolled in telepsychiatry program (e.g., video-conferencing, internet-based therapy) with those being treated as usual – in a 'face-to-face' setting. Most of such large-scale data and systematic analysis are with regard to video-conferencing as a modality of telepsychiatry. Literature reveals that telemental health has been applied in adults, children, adolescents, elderly, and even in special populations such as in prison inmates and veterans. The existing evidence in this field includes various aspects of health care delivery such as reliability of clinical assessments, clinical outcomes, outcomes in terms of acceptability and satisfaction of patients and clinicians, quality of life, and cost-effectiveness.

Applications of telepsychiatry

As mentioned earlier, sporadic reports of use of communication technology in routine and emergency clinical psychiatry have existed since 1960s. Both synchronous and asynchronous communications have been used for consultation, diagnosis, and management, follow-up, psychotherapy, education and supervision of and providing specialist support to medical professionals in rural and outreach areas.[16]

Telepsychiatry has been reported to be used for psychiatric assessment and follow-up in patients from general health services and psychiatric services suffering from various mental illnesses such as depression, panic disorder, posttraumatic stress disorder, bulimia nervosa, and schizophrenia.[17] Several programs using synchronous and asynchronous communication have been described for use of telepsychiatry for patients with mental health problems visiting the emergency department.[18] Besides the traditional referral to the psychiatrist who acts as the principal provider of mental health services, the consultation-care model where the primary care physician is the principal provider and the collaborative model where both the psychiatrist and the primary care physician are involved have been applied in telepsychiatric services. Besides video-conferencing, telephone, secure messaging (e-mail), and the internet are increasingly being used to provide consultation–liaison service to primary care.[19-21]

In addition, telepsychiatry in the form of video-conferencing has been utilized to deliver

psychotherapy – cognitive-behavior therapy,[22] supportive therapy, group therapy for depression and anxiety disorders, etc.[17,23] Video-conferencing has been used to provide trauma-focused therapies to war veterans with post-traumatic stress disorder and women afflicted with domestic violence.[24] Internet-based psychotherapies (e.g., cognitive behavior therapy (CBT)) involve programs that are highly structured, and include online lessons and homework assignments. These therapies include self-guided programs with no input from clinicians and clinician-guided programs that involve regular communication with a therapist via e-mail, telephone, or online forum. Internet-based CBTs have been conducted in patients with major depressive disorder, social phobia, panic disorder, agoraphobia, and generalized anxiety disorder.[25-29] Also, telepsychiatry has been used for neuropsychological assessments.[30] In addition, neurological tests such as measurement of abnormal involuntary movements have been carried out using video-conferencing.[31] Moreover, crisis intervention programs in the form of online counseling, personal communication through instant messaging, e-mails, and chat groups for people with suicidal ideas have been demonstrated.[32] In a report from India, it was noted that institutional e-mail helplines have been extensively used directly by patients and their relatives.[33] Telepsychiatry has found place in delivering services to geriatric population[34] who have poorer accessibility to specialist health care institutions. However, sensory impairments in this group may hinder the effective use of the communication technologies. In a similar manner, assessment, consultation, and educational services have been conducted in the field of child and adolescent psychiatry. A review[35] examining studies in this population found that clinical work has been carried out in the treatment of depression, anorexia, conduct disorder, and attention deficit hyperactivity disorder. Telepsychiatry projects involving prison inmates[36-38] where delivering mental health care from distance is considered more feasible (to avoid transporting the prisoners to the specialist institute) have also been demonstrated. Video link consultation and psychotherapeutic management of children and adolescents who are referred to forensic clinic[39] and who are incarcerated[40] have also been reported. Many of the programs of telepsychiatry also involve education to general physicians. A unique program involved training of psychiatry residents in treating veteran populations at remote sites.[41]

Satisfaction with telepsychiatry

Psychiatry as a discipline relies on human interaction and observation of human behavior, and this sets it apart from other disciplines of medicine. Whether 'tele' consultations can replace face-to-face interviews and interventions in terms of satisfaction of both provider and the client is an important question. There have been concerns that telepsychiatry may hinder many of the conventional practitioner–patient relationships that contribute to a psychiatric consultation and create a false sense of 'presence,' which is central to any psychiatric assessment.[42] On the other hand, a systematic review[17] concluded that various studies[43-47] have found no significant difference in patient satisfaction with video-conferencing as a modality to deliver mental health services when compared to face-to-face health care. One study also found higher satisfaction with telepsychiatry.[48] Two of these studies[45,48] focused specifically on patient satisfaction with the utilized technology and its quality. They found high level of satisfaction amongst the patients. Shore *et al*. (2008)[49] assessed satisfaction with video-conferencing on several process measures such as 'usability (of the technology),' regarding 'patient/provider interaction,' 'cultural competence,' and overall satisfaction. The authors found no statistical difference on these measures for the 'in-person interview' and the 'tele-interview.' However, professional satisfaction evaluated in two other studies[47,50] was found to be low with video-conferencing. In children and adolescent care, the technology of video-conferencing was found to be acceptable with increasing use and experience and, across various studies it was also found that the family members were satisfied with the video-conferencing service.[35] For neuropsychological testing, results have been equivocal with less satisfaction of psychologists reported by some.[30] The quality of audio-visual technology is known to affect both the reliability of and satisfaction with tele-consultation.

One study employed e-health services including internet-based services and telephonic care in addition to treatment as usual (physician visit and medication) for management of depression.[51] The authors found no significant differences in perception of quality of care or accessibility to care and information between the control and intervention groups. It has also been reported that patients show high levels of satisfaction when using e-mail to communicate with their doctor, and both patients and doctors have found it to be a convenient form of communication.[52]

Reliability of psychiatric assessment

Several studies[47,53,54] using video-conferencing have focused on the reliability of clinical assessments. The studies demonstrate high inter-rater agreement, and hence reliability of the diagnostic assessment. In a cross-sectional, balanced cross-over, blind study[55] assessing new psychiatric referrals by face-to-face interviews and video-conferencing, the accuracy ratio for diagnostic assessment as well as risk assessment of non-drug and drug interventions was evaluated. The accuracy ratio in all the parameters was found to be high. In a study[56] with 23 child/adolescent patients, it was seen that the diagnostic assessment was as good with video-conferencing as with face-to-face assessment. Also, telepsychiatry has been found to be a reliable alternative for diagnosing in geriatric population in

some studies. Jones (2001)[57] found that subjective verbal reports were more reliable than visual observations when video-conferencing was compared to face-to-face evaluation of geriatric patients. However, the study employed low bandwidth integrated services digital network (ISDN) lines which would also have contributed to some difficulty with the tele-assessments. However, it has been noticed that neurocognitive assessment may also take longer time, though produce reliable results. A meta-analysis found that agreement between in-person assessment and high-bandwidth telepsychiatry evaluation was excellent while that of in-person with low-bandwidth telepsychiatric assessment showed adequate, but somewhat lower agreement than the former.[58]

Outcomes (clinical outcome, quality of life, and adherence)

A recent systematic review[17] of 10 Randomized Controlled Trials (RCTs) comparing video-conferencing to face-to-face assessment included 1054 patients from general psychiatric services and with various mental illnesses, namely, depression, panic disorder, posttraumatic stress disorder, bulimia nervosa, and schizophrenia. In general, each study focused on diagnosis and follow-up. Five of these studies used CBT, while the rest did not specify a psychotherapeutic approach. The largest study[44] ($N = 495$) focused on diagnosis and interventions that included medication management, psychoeducation, counseling, and triage to other local services. The authors found no difference in effectiveness between the two groups. The unequivocal finding of the studies was that there was no significant difference in level of symptoms in the intervention (telepsychiatry) and control groups. However, one study in patients with eating disorder[59] found that the outcome was better in control group at 12 months, though was not different at 3 months, when compared to the intervention group. Another RCT by Fortney *et al*. (2007)[60] (not included above) with 395 participants found that those in the intervention group were more likely to respond by 6 months and remit by 12 months.

Also, most studies have found no significant difference in the quality of life[17] between the two groups. Amongst the RCTs (video-conferencing) focusing on treatment adherence,[45,46,60] two studies found higher rates of treatment adherence while one found no statistical difference. A non-randomized controlled trial[61] and another retrospective study[62] found that medication and follow-up compliance was higher in the intervention group.

Besides video-conferencing, telephone and e-mail have been evaluated for their effectiveness in rendering consultation. These modalities allow primary care physicians to gain ready access to specialists in order to enhance the quality of local care for patients.[63] An RCT compared two different modalities in treatment of depression.[21] These included an usual care, disease management module over the phone, and the phone and monthly televideo psychiatric consultation. The authors found that though there was improvement in both groups, there was a trend toward significance in the latter group. Also, patient satisfaction and retention was greater in the intensive group. The authors suggested that intensive modules using telepsychiatric educational interventions toward primary care physicians may be superior. Telepsychiatric consultation and treatment via e-mail has also been shown to be effective in patients with eating disorders such as anorexia nervosa[64] and bulimia nervosa.[65] Internet-based interventions, namely CBT for panic disorder,[66] social anxiety disorder,[67] and depressive disorders, and applied relaxation for panic disorder, have been found to be effective.[66] A study done in patients with social phobia has also documented that improvements made during internet CBT persist over a 30-month follow-up period.[26] The rates of dropout for internet-based interventions for anxiety and depressive disorders have varied from 1 to 50% in RCTs, and these have been considered similar to those in RCTs of non–internet-based interventions for these disorders.[67]

Telephone psychotherapy has been compared to usual care in patients with depressive disorders both in RCT[68] and in a non-randomized study.[69] Both studies found that the intervention resulted in significant reduction in depression severity. In addition to depressive disorder, telephone-based collaborative care has been found to be useful in treating panic disorder and generalized anxiety disorder.[70] Supplementation of internet-based CBT with weekly telephone calls for patients with panic disorder has been found to result in better outcomes as compared to patients who have received no intervention.[71]

CHALLENGES OF TELEPSYCHIATRY

Though telepsychiatry has huge scope and probably its full potential is not yet exploited, there are certain issues regarding this mode of service delivery which should be addressed. A major debate revolves around the cost-effectiveness of e-mental health as it has been depicted as a promising health care system that would save time, save expenses incurred on travel, and curb daily wage losses of the clients. However, whether such savings would balance the cost of setting up the requisite infrastructure including the support staff is an important question. Moreover, the cost-effectiveness would depend upon the technology utilized for the purpose. With further progress in telepsychiatry, the important issues of privacy, confidentiality, ethical and legal implications will also need attention.

Cost-effectiveness

There is preliminary evidence that telepsychiatry can be less expensive for patients as it proposes to reduce expenses

incurred in traveling, time taken for traveling, and time taken off from work. Research in this area includes studies that calculate costs theoretically, such as cost-feasibility studies and cost surveys, and those using more objective methods such as direct comparison of costs of telepsychiatry and in-person psychiatry, and cost analysis.[72] Ideally, a variety of factors/outcomes other than the financial cost need to be considered while determining cost-effectiveness, that include health outcomes, utilization, accessibility, quality, and needs for such services in the specific population studied.[73] In addition, equipment maintenance and upgrading costs should also be considered for cost analysis. Also, an increase in the volume of use results in telepsychiatry becoming less expensive. 'Break-even' cost analysis shows that an average of seven consultations per week are required to make telepsychiatry services cost-beneficial.[74,75] The interpretation of results also depends upon the perspective of analysis, the weightage given to cost and benefit to patients/family members, referring physicians, health care professionals, and health care administrators.

In a review of 12 studies,[72] it was concluded that results of seven studies suggested that telepsychiatry was worth the cost. Another review studying clinical and educational applications of telepsychiatry found that telepsychiatry appears cost-effective when costly transfers as in forensic settings and hospitalization are involved in management of the cases.[63] Regarding RCTs evaluating cost-effectiveness of video-conferencing, O'Reilly (2007)[44] found that on an average the cost was 10% less in the intervention group. Another study delivering CBT via a tele-link telemedicine compared the intervention with CBT delivered face-to-face in patients with bulimia nervosa. Both modes had similar efficacy, but CBT via a tele-link was associated with a lower cost per remitted subject.[76] On the other hand, Ruskin (2004)[45] found that the cost was lower in the control group. It has also been reported[77] that establishing a high-speed wide-area network that allows for telepsychiatry along with other telemedicine activities could reduce monthly telecommunications costs by approximately 67%. In addition, preexistence of ISDN lines at the sites involved reduces the cost.[78] E-mail and telephony appear as relatively cheaper alternatives as these do not require any additional technical support. Rahman *et al*. (2006)[79] conducted a feasibility study to train and empower existing staff at outreach sites in child mental health through the use of 'store and forward' method. The team utilized personal computers with internet connections and a dedicated e-mail address rather than a satellite service. The authors concluded that such a service was feasible at no extra costs. Another study[80] using the asynchronous technology (recorded video clips) conducted cost analysis comparing asynchronous and synchronous forms of telepsychiatry with in-person consultations. The authors found that the asynchronous technology was better in terms of cost-effectiveness when compared to synchronous mode and that it became the most cost-effective of the three models beyond 249 consultations. Nevertheless, more systematic studies involving both synchronous and asynchronous technologies are needed to evaluate the cost-effectiveness of telepsychiatry projects.

Legal and ethical issues

The major challenges in the use of telepsychiatry applications have been legal and ethical matters such as duty of care, role in emergency situations, privacy and confidentiality, and security of data. One of the important issues is defining the duties and role of the specialist consultant at a site distant from the patient. This crucial ethical issue of duty of care can be addressed by consultant services rather than therapist services via telepsychiatry. The consultant does not directly assume responsibility (which may be difficult to carry out, e.g., in emergency situations), but at the same time provides support to the primary care professionals.[81] In addition, this arrangement might resolve the 'tele' versus face-to-face care controversy with the essential components of empathy and human interaction not being disfigured by technological limitations. In addition, privacy and confidentiality are extremely important. It has been strongly suggested that the clinicians must ensure that the electronic information is effectively protected against improper disclosure when it is stored, transferred, received, or destroyed.[82] Security of data should include the appropriate collection and handling of user data, the protection of data from unauthorized access, and the safe storage of data.[83] It has been recommended that all forms of potentially identifying data, including clinical notes or electronic communications, must be appropriately handled. Comprehensive data security protocols must be defined and carried out in order to protect user confidentiality and privacy. Use of secure line and servers and use of encrypted software have been recommended.[2] Encrypted software helps safeguard against unauthorized interception and tampering of e-mail messages.[84] Clear guidelines and recommendations covering ethical issues such as informed consent and confidentiality, use of technology, and procedures for conducting assessment would be necessary.

FUTURE OF TELEPSYCHIATRY IN INDIA

Most telepsychiatry projects and programs have been reported from the developed nations like America, Australia, Canada, and certain European countries. In the developing nations, telepsychiatry has emerged initially as an offshoot of telemedicine and is still at a preliminary stage. Program descriptions are restricted to those where either education or consultation is provided to physicians or patients through existing e-mail services.[33,79] Another program from South India involved a mobile telepsychiatry

unit with video-conferencing facility to cater to one district.[85]

Certain modalities of telepsychiatry, mainly video-conferencing, though seemingly the best technology for clinical care, require more revenue as well as governmental and organizational commitment, and infrastructure. Also, live real-time interaction requires the presence of specialist professionals at the time of the consultation. In developing nations like ours, where there is already a dearth of mental health professionals, burdening the existing manpower to provide such services might prove to be counterproductive. Moreover, the issues of duty of care and handling of emergency situations remain unresolved. On the other hand, integration of mental health care in the existing system of primary health care might be more gainful without overburdening the resources. Such an objective is reflected in the National Mental Health Programme (NMHP).[86] To ensure the availability and accessibility of minimum mental healthcare for all in the foreseeable future, particularly to the most vulnerable and underprivileged sections of the population, and to apply mental health knowledge in general healthcare and in social development are the chief objectives of the NMHP. To this end, diffusion of mental health skills to the periphery of the health service system, and thus integration of mental health with primary health care are the main strategies. Telepsychiatry holds promise to further such objectives through the training and supervision of primary care physicians. Furthermore, such an approach shall empower the primary care professionals to deliver mental health services directly to the underserved population, besides having support and supervision from specialists. Such training and consultation to frontline workers available in the community (in comparison to direct consultation to patients/clients) seems to be a more efficacious model for service and program consultation.[37] The consultation model of telepsychiatric services, wherein the primary care physician maintains primary responsibility for the patient whereas the specialist makes recommendations but does not directly manage or prescribe medications, appears to improve the independence of the primary physicians over time. It has been seen that the referral patterns of primary care physicians participating in such a model of care showed a gradual transition from requesting assistance in diagnostic process to increased requests for assistance with developing or modifying management plans.[20] Thus, such a strategy can be envisaged to ensure appropriate use of human resource, being cost-effective both in the short term and more so in the long term as over time it may be expected that primary care physicians would require less support. In addition, an important ethical issue of duty of care can be addressed by consultant services rather than therapist services as the consultant does not directly assume responsibility (which may be difficult to carry out, e.g., in emergency situations), but at the same time provides support to the primary care professionals.[81]

In order to train and support the primary service providers, it has been suggested by Sharan and Malhotra (2007)[81] that developing software packages with codified medical knowledge as an aid to assessment, diagnosis, and management will be necessary. In addition, a model of logical decision support system (for diagnosis and management) with facilities for real-time as well as store–forward (web-based) video recording, tele-conferencing, and creation of electronic medical records will be required. Further, its application also calls for optimizing and expanding the scope of duties of psychiatrists so as to include training and supervision of general physicians providing mental health care. In keeping with the above objectives, a project involving development and implementation of a model telepsychiatry application for providing mental health care in remote areas has been started in joint collaboration between Department of Science and technology, Govt. of India, and Postgraduate Institute of Medical Education and Research, Chandigarh. The project involves development of telepsychiatry software for diagnosis and management of common psychiatric disorders in adults and children. Emphasis is on codifying medical knowledge, providing decision support system for diagnosis and treatment, and eventual narrowing of mental health gap.

Telepsychiatry, thus, holds the potential to solve the enormous and intertwined problems of underdiagnosing and undertreating persons with mental illness and the lack of trained manpower at grassroot level. Also, India, a leader in global economy and a hub of technology, must take a parallel initiative to set up procedural guidelines and recommendations as the field grows. As telepsychiatry gains momentum, well-planned comparative studies assessing diagnostic reliability, efficacy, and cost-effectiveness should also be carried out in developing countries to further the progress of the field tailored to the specific needs and resources of the developing world.

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