


Internet-Based Learning for Professionals in Addiction Psychiatry: A Scoping Review

Nishtha Chawla¹ , Shreeya Gyawali², Pawan Sharma³  and Yatan Pal Singh Balhara¹ 

ABSTRACT

Background and Aim: Distance learning techniques are gaining popularity as the internet today is a faster and more convenient source of spreading exhaustive information. We aim at conducting a scoping review on the utility of internet-based learning in addiction psychiatry.

Methods: We performed a systematic search of databases such as Google Scholar, PubMed, and Cochrane using the following keywords: Distance education, substance related disorder, teaching, internet, along with the MeSH terms (“Internet” AND “Teaching” AND “Substance Related Disorders”) OR (“Distance Education” AND “Substance Related Disorders”). The reference lists of articles were searched for other relevant literature.

Results: A total of 34 studies were included. Most of the courses offered online were on specific therapies, for example, training on motivational interviewing, twelve-step facilitation, cognitive behavioral therapy, alcohol screening, and brief intervention. They were based on various aspects of distance learning such as the acquisition of knowledge or skills, feasibility, level of satisfaction of the trainees/students, the cost-effectiveness of the techniques,

and the type of trainees who have access to the course. The majority of the studies showed positive findings in terms of the parameter being studied. However, the level of satisfaction among the students is questionable.

Conclusion: Internet-based teaching programs provide a good alternative to traditional educational methods in terms of effectiveness, feasibility, and acquisition of knowledge and skills. We emphasize the use of internet-based training in addiction psychiatry reinforced by actual practical experiences.

Keywords: Addiction psychiatry, Distance learning, Internet-based learning, Web-based learning

Distance learning techniques have evolved since the 1840s when a system of teaching via post-cards was used for the first time. This was followed by the introduction of correspondence courses in universities. Subsequently, the use of radio and television to disperse information provided access to remote education.¹ In the present day, the internet provides a convenient and exhaustive source of taking learning opportunities closer to a wider section of

the population and has been applied in medical education over the past few decades.^{1,2}

The impact of the use of psychoactive substances (e.g., alcohol, tobacco, and other drugs) is enormous, with tobacco being the most prevalent (consumed by 23% of the world’s population).^{3,4} Services for substance use disorder (SUD) have, traditionally, been delivered separately from psychiatric and other general health care services.⁵ The growth in numbers of trained human resources has lagged behind the increase in demand for services for the management of SUD. This is because of a lack of resources, insufficient training, and workforce shortages.⁶ The World Health Organization Atlas on Substance Use (WHO ATLAS-SU) survey on resources for the prevention and treatment of SUD, conducted in 162 countries, highlighted the deficiencies in training programs for management of SUD worldwide. Around 30% of the nations, including the majority of low-income countries, reported that no training programs for any workforce for the management of SUD existed in their country.⁷

¹Department of Psychiatry and National Drug Dependence Treatment Centre, All India Institute of Medical Sciences, New Delhi, Delhi, India. ²North East London NHS Foundation Trust, London, United Kingdom. ³Department of Psychiatry, Patan Academy of Health Sciences, School of Medicine, Lalitpur, Nepal.

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Address for correspondence: Nishtha Chawla, Department of Psychiatry and National Drug Dependence Treatment Centre, All India Institute of Medical Sciences, New Delhi, Delhi 110029, India. E-mail: nishtha.chawla@gmail.com

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The integration of substance use training in medical schools is limited by lack of curricular time, interdepartmental coordination, and experienced and interested faculty.⁸ The availability of fellowship in addiction medicine is scarce in low resource settings, despite having a higher burden of SUD.⁹ The online platform may turn out to be a boon in such settings. Surveys have found that 80% of the students of the current generation use social media on a daily basis, 20% of whom use it for studying, sharing online material and information, and organizing meetings/peer classes.^{10,11} Since 2010, there have been rising publications on the use of social media for medical education.¹²

Various branches of medicine, such as infectious diseases, cardiology, diabetes, critical care, etc., offer online courses and certifications.¹³ Various organizations offer such online courses.^{14,15} Many online training programs have proven successful, such as an online program on social prescribing¹⁶ and the incorporation of social media for dermatological education.¹⁷ The reason behind the success of such online programs is minimal requirement of physical examination, with the possibility of doing a video examination. For example, carrying out a mental status examination and looking at the blood investigations and other metabolic parameters in a case of diabetes are feasible. Similarly, training courses on medical management with minimal or no invasive procedures can be conveniently taught online. At present, internet-based teaching is accepted as an important modality across many fields of medicine.^{18,19} In psychiatry, particularly addiction psychiatry, such courses may be beneficial as the primary basis of diagnosis is a detailed history and mental status examination.

Although the existing curricula emphasize the need to integrate addiction psychiatry into other specialties, this has not yet been accomplished because of the inability to accommodate on-site training in addiction psychiatry on a large scale.⁹ Furthermore, there is a limited number of trained professionals in addiction psychiatry to impart training and match the exponential rise in substance-related disorders across the globe, particularly in low-resource settings.^{6,7} Hence, there is a need to

consider alternatives, such as internet-based learning, to address the dearth of human resources. However, subtle differences in psychiatry and addiction psychiatry from other branches of medicine should also be kept in mind while planning and imparting online courses, for example, the need to have a command over the language and cultural background of a particular region while practicing there. The expression and interpretation of symptoms may vary greatly from region to region and thus affect the diagnosis entertained by the trainee and eventually the success/outcome of a training course. In India, various institutions provide training in addiction, such as the Centre for Addiction Medicine, National Institute of Mental Health and Neurosciences, Bengaluru (<https://nimhans.ac.in/cam/?q=node%2F3>); All India Institute of Medical Sciences, New Delhi in collaboration with the Government of India (<https://naat.co.in/>); Mahatma Gandhi Labour Institute, Gujarat that offers a short-term course (<https://mgli.gujarat.gov.in/de-addiction.htm>); National Institute of Social Defence (http://www.nisd.gov.in/drug_abuse_training.html), etc. However, no data is available on the efficacy, acceptability, or cost-effectiveness of most courses.

With the current review, we intend to give an overview of the existing scenario of internet-based training in addiction psychiatry. We also aim to address some pertinent questions, for instance, how internet-based training can be applied in addiction psychiatry, who forms the target population of these courses, what is being taught through these courses, their effectiveness vis-a-vis in-live teaching in terms of increasing knowledge and skills of the trainees, accessibility, acceptability by the trainers as well as trainees, cost, feasibility of such training programs, and so on.

Methodology

The PRISMA guidelines for systematic reviews and meta-analysis were employed for conducting the literature search, using a systematic and structured approach.²⁰ PubMed, Cochrane, and Google Scholar were searched until May 2021 using the following keywords: distance education, substance-related disorders, teaching, internet along

with the MeSH terms ([“Internet” AND “Teaching” AND “Substance Related Disorders”] OR [“Distance Education” AND “Substance Related Disorders”]). Observational, interventional, ecological, and exploratory studies that had full-texts available in the English language were included. Studies with a focus on the effectiveness of web-based training in SUD and those imparting training on addiction psychiatry (psychological or pharmacological interventions) to individuals in the field of addiction psychiatry (medical/nursing students, residents, paramedical staff, etc.) were included. Studies on imparting web-based interventions to patients of SUD, online surveys assessing substance use knowledge/attitude/practice, studies on the feasibility of online courses from the perspective of a patient/individuals who use substances, and studies on distance learning through offline mode were excluded.

After assessing the titles and abstracts, full texts of the articles deemed suitable were retrieved. The contents of the studies were further examined to determine their final inclusion in the review. Furthermore, the reference lists of the selected articles were examined to search for additional suitable publications that might have been overlooked in the previous search. Data extraction was carried out by three authors (PS, NC, and SG) independently. Parameters explored by each author included the year and place of study, type of study, study participants, type of online course with its duration, mode of teaching, criteria for effectiveness, and the results of each study. Compilations by all authors were compared and discrepancies were resolved by mutual consensus.

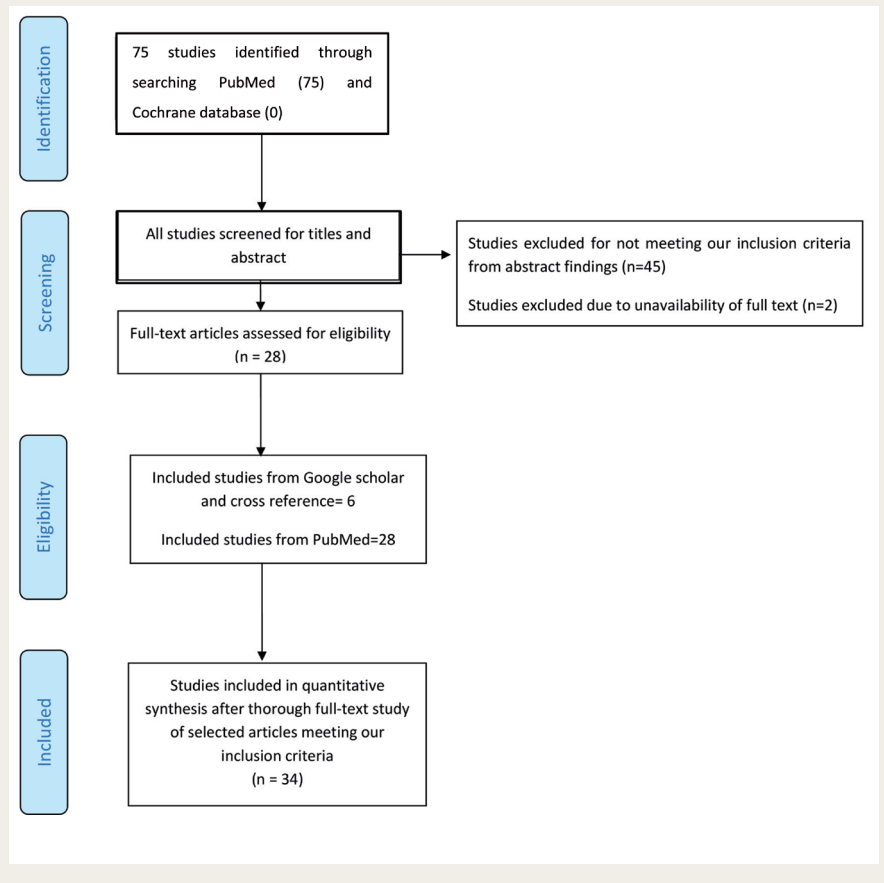
Results

The initial search yielded a total of 75 articles. Thirty articles from PubMed were eligible. Because of the unavailability of full-text, two articles were excluded. No additional articles were found on the Cochrane database. Search on Google Scholar yielded six additional articles (**Figure 1**). Thus, a total of 34 articles were included in this review (**Table S1**).

The majority of studies used quantitative methods, a few used purely qualitative design,³¹ while six used mixed

FIGURE 1.

Flow Diagram for Methodology



methods.^{21–26} These included surveys with short-answer questions or interviews along with quantitative measures and studies that compared a web-based curriculum with controls.^{21,23,27,28} Pretest/posttest design was a common mode of the study of the effectiveness of online teaching. Other studies included randomized controlled trials and prospective observational and descriptive studies.

The studies were set in higher educational institutions and small community settings ranging from veteran administration addiction treatment programs²⁹ to community-based substance use treatment centers.³⁰ Sample size ranged from 21 to 1,386. Participants ranged from first to final year medical students, residents in psychiatry, and internal and family medicine, clinicians, counsellors, nurses, physician educators, schoolteachers, and predoctoral and dental students. The purpose statements across studies stated a wide range of focus. These included the acceptability of the online course to the participants, the feasibility of online

courses, the extent of improvement in the participants' skills or knowledge, and its incorporation in daily clinical practice.

Most of the studies included training on psychotherapeutic intervention techniques. These interventions included motivational interviewing (MI), brief intervention, cognitive behavioral therapy (CBT), and other behavioral changes intended to establish incongruence in drug-seeking behavior. Other prominent content of the courses involved learning about screening for substance use and its pharmacological interventions. Some courses focused on the extent of the substance use problem and its impact on a global scale. Multiple themes were studied in a single paper as well. The substance type targeted by the courses commonly involved alcohol and tobacco. Other less commonly covered substances included opioid poisoning and cocaine abuse.

The primary and secondary outcomes were acquisition in knowledge and skills, feasibility, cost-effectiveness, differences

in patient outcome, and participants' acceptance of the online teaching interventions.

Acquisition of Knowledge and Skills

The results of studies on knowledge and skills have been presented under the following subheadings: (a) MI, CBT, and pharmacological intervention, (b) screening and brief interventions, and (c) drug epidemiology, use, and treatment.

MI, CBT, and Pharmacological Intervention

An overall gain in knowledge and skills in MI, pharmacological interventions, and assessment of tobacco use was observed after completing an online expert-facilitated course on tobacco dependence treatment.³¹ Similarly, positive outcomes were seen in different studies comparing intervention by online training with no intervention (e.g., acquiring CBT skills following a 20-h web course [vs. manual only],³⁰ acquiring counselling skills and a positive attitude toward treatment efficacy after using an internet-based module).^{25,26} A three-step approach (distance learning web course, followed by a skill-building workshop, followed by competence-based supervision) MI found that clinicians who came up with adequate performance after step 1 continued working at the same level after the next two steps.²⁹ It is interesting to note that some studies had contrasting findings where acquisition or use of counselling or CBT skills were poorer or comparable in online intervention *viz-a-viz* in vivo intervention.^{24,32,33} A study involving staff at a substance abuse treatment organization found statistically significant improvements in self-perceived knowledge and skills, but a clinically insignificant increase in knowledge, after 15 h of video workshop on MI.³⁴

Screening and Brief Interventions

Upon assessment of change in attitude, knowledge, and confidence in screening and providing interventions in SUD or in imparting teaching for SUD management, web-based modules showed positive results in various groups of participants in different studies (some of which were comparative).^{22,24,26,35–37}

A nonrandomized study compared learning outcomes in terms of knowledge, attitudes, and skills between on-site ($n = 45$) and distance learning ($n = 18$) nursing students receiving training on screening, brief intervention, and referral to treatment. It found a significant increase in the skills required for patient interaction but not in confidence or knowledge in the distance learning group.²⁸ Another controlled trial on first-year medical students that compared an interactive web module group with offline lecture group found no significant differences in improving competency in screening and interventions for hazardous drinking.²⁹

Knowledge About Drug Use and Treatment

Improvement was noted in the knowledge about substance abuse and drug diversion amongst medical students along with increased confidence in application of that knowledge after delivery of a web-based module.³⁸ Another web-based educational smoking cessation program was delivered to nurses and significant improvement was noted in knowledge, skills, about tobacco control.³⁹ A significant improvement in attitudes about tobacco control was also found. After an online course with didactic modules, a significant increase was seen in knowledge of smoking epidemiology, health effects of smoking and benefits of smoking cessation, and effectiveness of smoking cessation treatments.⁴⁰ An internet-based teaching module on management of simulated opioid poisoning/overdose was found to be effective in teaching the basic principles of management of such cases, evident by the high knowledge scores on testing.^{41,42}

Finally, other than the acquisition of knowledge in the areas mentioned above, studies have demonstrated changes in patient parameters post distance learning by care providers, which could indirectly reflect the increase in skills of the individuals. For example, a study found that after a distance-learning course by the service providers, the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) scores of their patients significantly reduced for alcohol and cocaine.⁴³ However, a randomized trial did not find any change in drug use on patient feedback survey

or any change in the therapeutic alliance after taking of the course by service providers.⁴⁴

Cost Effectiveness

A study on 143 addiction clinicians demonstrated that the cost of the in vivo approach was twice that of the distance learning approach and ten times that of the manual-based approach.³³ Another study on medical and nursing students also showed that web-based training was cost-effective and accessible to the participants.²⁴

Feasibility

A study to evaluate visitors' use of an internet course on Alcoholics Anonymous found that out of 414 participants, 294 (71%) completed the course.⁴⁵ Some surveys have shown higher completion or response rates for online modules than offline.^{23,37} Another study found overall ease in delivery of education through the online platform and a majority of the participants, primarily physician instructors, preferred to use web-based enhancements.⁴⁶ However, the findings on feasibility are not ubiquitous. For instance, a web-based CBT course for substance abuse counsellors ($n = 22$) found that 41% of the participants were not engaged in previous online course work, 33% had difficulty downloading audio, and 54% required more than 45 min to complete.⁴⁷ In fact, the completion rate was only modest in these studies, with participants facing challenges ranging from motivation to technical problems.⁴⁶

Participant Satisfaction and Acceptability

In a comparative study, the intervention group who attended a workshop on alcohol screening and brief intervention via web-based curriculum experienced more confidence in teaching than the control group who did not attend. A significantly higher number of individuals in the intervention group reported using any part of the curriculum than the control subjects.²² Another study showed that 91% of counsellors ($n = 22$) were immediately and positively affected by a web-based course on CBT for substance abuse counsellors.⁴⁷ After attending the

Alcohol Abuse Management in Primary Care e-learning course, students reported it to be an appreciated learning tool that provided effective knowledge transmission and retention.⁴⁸ Furthermore, the staff of a project in which computer-centered technology was used to deliver clinical risk assessment training in a specialist addictions unit through case vignette, slides, audios, and videos found the resource easy to use, convenient, and appropriate for their role.⁴⁹ Another study found that after a distance learning course, 55% of professionals ($n = 2,420$) were highly motivated and confident to apply screening and brief interventions in practice.⁴³

Interestingly, whereas many studies highlight the high acceptability of web-based training, several studies also highlight its problems. In a study, merely 22.6% of participants ($n = 277$) were satisfied with the overall quality of the online training (The Training Enhancement in Applied Cessation Counselling and Health Project).²¹ Some studies have shown a higher level of satisfaction among those who attend live lectures viz-a-viz web-streamed lecture.²⁵ A survey on an online course that was followed by an in-person training on office-based buprenorphine therapy found that even though the online course received reasonable ratings, it was considered significantly less favorable than in-person training.²³ These conflicting results in satisfaction and acceptability of web-based modules may be attributed to variation in the course content and the user-friendly nature of some courses.

Discussion

Studies in this review have used different methodologies, including qualitative, quantitative, and mixed methods. To ascertain the effectiveness of the distance learning courses, pretest/posttest methods have been applied. A few randomized controlled trials have also been conducted. While randomized trials have provided a robust experimental design, prospective cohort designs have been able to highlight the long-term change in skills and knowledge post course. Another point reflected in the review is the diversity in educational settings and participants in the various studies included, thus making the findings

more generalizable. This also highlights the benefit of incorporating online courses among a variety of participants and educational settings. However, the review also suffers from a lack of comparability among these studies because of the tremendous heterogeneity. The lack of uniformity across the studies also extends to the type of substance use studied, the target population of the courses, and the characteristics of the courses, such as the type, content, and duration. Furthermore, the primary and secondary outcomes have not been uniform across the included studies. This has resulted in an inability to perform a meta-analysis and an inability to draw definitive conclusions about the effectiveness of these courses.

Nevertheless, the effectiveness of the distant courses in disseminating skills and knowledge to the users appears promising. Web-based lectures, solely or after supplementing with manuals, have shown an increase in the participants' skills.^{31,33,38} Web-based lectures are also noted to have a higher adherence rate than live lectures.³⁰ However, this observation is not uniform across all studies and the literature presents conflicting results. For instance, better acquisition of skills through in-person training rather than web-based training has been seen in a study, which can be attributed to better feedback, clarifications of doubts, and discipline followed during in-live training. Furthermore, the skills have been seen to progressively grow with in-live learning in contrast to online courses where stagnation, or even deterioration of skills, is noted with time.³³ Another study showed that some level of supervision improves the level of acquired knowledge or skills.³⁰ However, the point of contention here is that many studies have made comparisons of online training with no training or manual-based training, which might overestimate the positive outcomes with an online module.

The other noteworthy issue seen with distance learning is the application of the learned skills in a practical setting. It has been seen that even though the gain in knowledge in certain CBT skills through web-based platforms might be at par with in-live classes, the frequency of use of CBT skills was much higher by the physicians who received in-live train-

ing.³³ This might, however, reflect the nature of the complexity of the psychological intervention and the suitability of learning in the presence of an in-live supervisor.

The review underlines the fact that it is not possible to define web-based learning as either good or bad. Owing to the immense variation in technology, it is not justified to make generalized statements or treat the online platform of learning as a single entity. A more useful approach is to analyze the settings and conditions in which this platform can be used effectively and study how to tap the potential of this mode of imparting knowledge and learning in order to optimize its use.⁵¹

There is no denying the fact that web-based learning and distance education are cost-effective, easily accessible, and conveniently deliverable. However, issues with the usability, taking more time than intended to complete the course, and technical problems lead to a modest completion rate and undermine the overall potential impact this platform can have.^{46,47} Although the acceptability of these courses is good and they have shown a favorable outcome in patient-related measures such as the Alcohol, Smoking and Substance Involvement Screening Test scores,^{43,44} the search for a valid instrument for evaluating educational outcomes in distance learning is still ongoing.^{52,53} In the case of distance learning, the strategies of time management, metacognition, effort regulation, and critical thinking have been found to correlate positively with academic outcomes.⁵⁴ However, it is difficult to ensure and assess all of these qualities in the participants of an internet-based training program.

A prerequisite, especially for third-world countries, is the feasibility and availability of this platform. It has been observed that the ease of implementation of a program correlates well with the program's intended outcome. Hence, if the implementation is difficult, programs may not be implemented as planned, thereby affecting the overall outcome.⁴⁶ Furthermore, some courses may need alteration; for instance, they may need to be more interactive, with the inclusion of knowledge-based quizzes, videos, live webinars, and so on, depending on the population they are

catering to. For example, it is anticipated that undergraduate and postgraduate students may be more interested in or motivated by quizzes or competitive platforms. Established consultants/faculty/researchers may not be interested in a high-scoring quiz competition but in an interactive session with experts or live webinars. On the other hand, busy clinicians may not be able to match timings for live sessions and might express comfort in watching prerecorded videos. Better website navigation and flexibility in accessing the course content for back-to-back study are sometimes lacking in various courses.²¹ Moreover, with distant courses, it is difficult to assess the level of participation and the changes in students' attitudes, knowledge, skills, and behaviors.⁴³ Finally, the results of the studies on web-based learning need to be assessed carefully, as each of these courses differs in its rationale, content, duration, and navigation techniques. A review of all online courses on tobacco dependence treatment found that even though some of the included studies were good at providing effective navigation, course rationale, and content, 17 of the 24 courses evaluated failed to meet minimal quality standards.⁵⁵

The practical application of knowledge/skills acquired through internet-based courses into clinical settings has been studied only by a few researchers. Even lesser literature compares the skills obtained from web-based courses with those acquired through live lectures or under supervision. There is a need to study imparting of complete training on substance-related problems, with adequate sample sizes, and carrying out assessments that are feasible.

Some limitations of the present review should be considered while drawing inferences from the findings. The review has not conducted a meta-analysis of the study findings, and hence summary analysis was not possible. In addition to PubMed, only Cochrane and Google Scholar were the databases used in searching the articles. Thus, some of the studies might have been missed, although we attempted to gather all relevant literature. Despite the above lacunae, our review reflects that internet/web-based learning is an invaluable tool for providing knowledge and skills at a relatively low cost, warranting a more

widespread implementation to gain further insight into its utility and potential issues.

Conclusion

There has been a significant rise in SUD in the past two decades, without a corresponding increase in trained human resources for its management. Internet-based training remains a largely unexploited area capable of producing a workforce trained to tackle SUD. The results of this review might help plan and progress to evidence-based dissemination of specific internet-based training in addiction psychiatry. We emphasize the use of internet-based training in addiction psychiatry, reinforced by actual practical experiences, to supplement the deficiency of trained human resources in this field. However, further studies are required to determine the characteristics of health professionals best suited for internet-based training and the content that could be delivered using this platform.

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ORCID iDs

Nishtha Chawla  <https://orcid.org/0000-0002-9009-4105>
 Pawan Sharma  <https://orcid.org/0000-0003-4983-7568>
 Yatan Pal Singh Balhara  <https://orcid.org/0000-0003-1616-6403>

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