CHAPTER 9

E-LEARNING AS AN ADJUNCT TO A FACE-TO-FACE TRAINING ON SUICIDE PRACTICE SKILLS. A POST-HOC EVALUATION

Background

E-learning is becoming a popular educational method to train mental health professionals. However, there is not much information on the development and evaluation of e-learning within mental health care.

Objective

To facilitate developers of new e-learning modules by evaluating use and appreciation of an e-learning module that was part of a Train-the-Trainer program to implement a suicide practice guideline.

Methods

Post-hoc analysis of data collected in the intervention condition of a large national randomized controlled trial. An e-learning supported Train-the-Trainer program was used to train the staff of 22 departments spread over 9 mental health institutions. Each participant in the intervention condition received an online questionnaire before the start of the intervention. After completing baseline items participants automatically received an email with the login codes for the e-learning module. Next, they followed a face-to-face training given by a colleague, who was trained by experts on suicide prevention to train his own peers. The training given to peers consisted of a one day, small group face-to-face training, focusing on the structural interviewing, diagnosis and treatment of suicidal patients. The e-learning module was offered additional to the face-to-face training and could be accessed before and after the training. Three months after the face-to-face training, professionals answered items on guideline adherence and on the use and appreciation of the e-learning module.

Results

The module was developed in half a year, primarily by a PhD candidate without specific programming skills. No effect of the e-learning above and beyond the face-to-face training was found. Problems with the ICT environment within all 9 mental health institutions limited access to e-learning module. 55% (n = 124) of the 224 respondents stated they had used the e-learning module for an average time of 40 (SD =18) minutes. 77% (n = 95) of the professionals stated they learned a lot on the topic of suicide prevention, 87% (n = 95) found the e-learning a good addition to the training, and that 78% (n = 104) would recommend the e-learning module to their colleagues.
Conclusions

It was possible to develop an e-learning module with little means that was highly appreciated. However, no differences on outcomes between users and non-users were found. Future studies should investigate the effectiveness of e-learning compared to face-to-face using a randomized design. Special care should be taken to (technically) facilitate access to the e-learning module at work.

Background

In 2012, the Dutch multidisciplinary Practice Guideline on the Assessment and Treatment of Suicidal Behavior has been issued. To implement the guideline in Dutch mental health care, an e-learning supported Train-the-Trainer program (TtT-e) was delivered to the staff of psychiatric departments. Professionals were trained by experts in suicide prevention. Next, these professionals trained their own peer-colleagues in a one day face-to-face training. The face-to-face training was supplemented with an e-learning module, as multifaceted interventions have been found to be more effective when compared with single interventions. Advances in technology, the rising costs in health care and the need for continuous education of (para)medical professionals have made e-learning a popular new educational method. In both undergraduate and graduate medical programs, the use of e-learning modules is widespread. It is used successfully in several medical fields such as dermatology and surgery as these disciplines allow to teach concrete and measurable skills such as skin examination. Interpersonal skills, the basis of the psychiatric discipline, are perhaps more difficult to learn via e-learning, resulting in less application of e-learning in psychiatry when compared to other disciplines. However, also in mental health, e-learning is gaining popularity. Currently, the university of Oxford is developing e-learning modules to disseminate psychological treatments around the world and in the Netherlands, mental health institutions are joining hands to make e-learning widely available to mental health professionals in the Netherlands.

Previously, we examined the effectiveness of the blended intervention (face-to-face + e-learning) in a cluster randomized trial. Preliminary results showed that the use of a TtT-e model is effective to implement the guideline at both the professional and patient level. Compared with conventional strategies, TtT-e leads to better guideline adherence by nurses and more confidence and knowledge regarding suicidal behavior among members of all disciplines (nurses, psychiatrists, psychologists, therapists). At the patient level, we found that the training had a positive effect on suicidal patients with a depression.

We did not investigate the relative effectiveness of the e-learning module in comparison with the face-to-face training. We did find that the e-learning module was well received, and that there is a clear need for more information on how to develop an e-learning module.

By post-hoc describing the development and feasibility of the e-learning module used alongside a Train-the-Trainer program, we aim to facilitate...
new developers of e-learning modules. As blended learning is assumed to be more effective than only face-to-face training, we argue that outcomes would be better for professionals that followed both the e-learning module and the face-to-face training, when compared to professionals that followed face-to-face training only. First, we describe the design of the PITSTOP suicide trial, focusing on the role of the e-learning module within the intervention. Next, we elaborate on the development of the e-learning module. Using baseline and 3 month follow-up data from the intervention condition of the PITSTOP suicide trial, we evaluated post-hoc whether baseline characteristics such as age and gender could indicate which participants would use the e-learning module. We also report on the professional’s use and appreciation of the module. Finally, we examined if guideline adherence at follow-up of professionals that used both the e-learning and the face-to-face training differed from the outcomes of professionals that only followed the face-to-face training.

PITSTOP suicide trial

The e-learning module was part of a large national randomized controlled trial investigating the effects of an e-learning supported Train-the-Trainer program (TtT-e) called PITSTOP suicide. Within the trial, psychiatric departments were considered eligible for participation if they treated patients aged ≥18 years, if professionals considered a need for training in suicide prevention skills, if the training was supported by the institutional board and if institutions were willing to accept costs due to loss of productivity. Eligible departments were matched in pairs based on primary patient diagnoses and average treatment duration. Members of matched pairs were randomly allocated to either Implementation as usual (internet, congresses, booklets etc.) or TtT-e (intervention). Binary randomization was performed by an independent researcher of the Dutch Institute for Health and Care Research who was not involved in the study. Outcomes of matching and randomization are described elsewhere. Twenty two departments spread over 9 mental health institutions were randomized to the intervention condition. Each participant in the intervention condition received an online questionnaire two weeks before the face-to-face training. After completing all baseline items participants automatically received an email with the login codes for the e-learning module. Next, they followed the face-to-face training given by a colleague, who was earlier trained by experts on suicide prevention. The training consisted of a one day, small group face-to-face training, focusing on the structural interviewing, diagnosis and treatment of suicidal patients and is described in more detail elsewhere. The e-learning module was offered additional to the face-to-face training and could be accessed before and after the training. E-learning was expected to complement the face-to-face training; it was found to help medical students become more actively involved in the study material and thereby help to internalize the material. Three months after the face-to-face training, professionals received a second questionnaire.

Measurement

In the intervention condition, two weeks before the face-to-face training of the departments’ staff was planned, the baseline assessment (T0) was sent to the trainees by e-mail via an online survey platform called Qualtrics. Completing baseline assessment was mandatory to have entrance to the face-to-face training and to gain access to the e-learning module. A follow-up assessment (T1) was planned at three months after the training. Professional credits were awarded if professionals completed T0 and T1 and had attended the training.

Baseline characteristics

At baseline, we asked for demographics and profession (nurse, psychologist, psychiatrist, other), years of experience in psychiatry, years of experience with suicidal behavior and number of trainings followed on discussing suicidal behavior.

Primary outcome

The primary outcome was improvement in suicide practice skills due to the blended intervention. Most instruments that measure clinical skills are self-report measurements, i.e. they ask the respondent to reflect on his clinical skills. To more directly and realistically assess change in clinical skills, we selected five 30-second video vignettes from the e-learning module material. Two vignettes introduced a suicidal depressed old man, one video displayed a suicidal psychotic man, the fourth a young woman after a suicide attempt, and the last one a narcissistic widower with a death wish. Participants were asked to rate (on a Visual Analogue Scale ranging from 1 to 100) the likelihood that, within the next 10 minutes, they would respond with 25 possible replies. The content of the replies was based on the recommendations of the guideline. For example: ‘Ask whether the patient thinks about suicide’. ‘Ask how hopeless the patient is feeling’. The items and an example of a video vignette can be found in Multimedia Appendix 2.

To estimate guideline adherence, all 125 item scores (25 items times five vignettes) were summed and divided by the total amount of items, resulting in mean scores ranging from 0 to 100, with higher scores representing stronger guideline adherence. A reference score was set by a panel of suicidology
experts (n = 6) who once completed the video vignettes, resulting in a score of mean (SD) 75.0 (6.0). Cronbach’s alpha within the sample for the total 125 items was .88. Cronbach’s alpha for items of individual vignettes ranged from 0.88 to 0.91.

Feedback regarding technical difficulties

As we got several complaints from users that they could not use the module due to technical problems (fire-wall, no sound card), we asked key professionals from each institution to report on the most prominent technical barrier after all data was collected.

Post-Hoc Data analysis

To explore the relation between the use of the e-learning module and outcomes at follow-up, we fitted a linear model with follow-up outcome scores as the dependent variable, baseline outcome score as a covariate, module use (yes/no) as a between-group factor. Mean (SD) differences between baseline and follow-up between users and non-users were expressed as regression coefficients (b), 95% confidence intervals and p-values. To investigate whether baseline characteristics related to the use of the e-learning module, we used a logistic regression analysis. The binary dependent variable was use of the module (yes/no) and the independent variables were gender, age, profession, years of experience in psychiatry, years of experience with suicidal patients, any previous training in discussing suicidal behavior, and the baseline scores on the primary outcome. Differences between users and non-users with regard to each variable were expressed as odd ratio’s (B), 95% confidence intervals and associated p-values.

Development of the E-learning module

The e-learning module for trainees is based on the five main recommendations of the guideline 22 (I: making contact, II: safety of patients, III: involving significant other, IV: continuity of care, V: systematic assessment and treatment of suicidal behavior). To cover the content of the guideline 22, scenario’s for six videos were developed by the research team (a chronically depressed older man, a young girl with a borderline disorder, a psychotic homeless man, a narcissistic old widower with a death wish, a young man with latent suicidal thoughts and a chronically suicidal woman in a hospital after being treated at the emergency department for a suicide attempt). These patients were found to represent the variety of suicidal patients in mental health care 23. By choosing a wide range of patients, we hoped to make the module useable for professionals from different psychiatric departments. We deliberately did not script the dialogues as we wanted to have as much a realistic scene as possible, and did not want the professionals to be acting. From the suicide expert network that was involved in the development of the guideline, two experienced nurses and two experienced psychiatrists were selected to play a role model in the module. We hired five actors to play the five different patients. Media professionals of VU University and a sound engineer recorded the scenes with two cameras, while the first and last author were directing the scenes. We recorded each scene for over three hours. Next, the first author edited the videos into 5-minute scenes, selecting those parts that reflected the guideline recommendations best. Next, he developed the e-learning module by integrating the recommendations with the video clips, using a plug-in of PowerPoint called Adobe Presenter 7. Adobe Presenter allows to turn a set of PowerPoint slides in e-learning content without any additional computer coding. It enables users to record narration over PowerPoint slides, and to add existing Video clips. The module was put online through Adobe Connect Pro, a program that allows to publish Adobe Presenter files on a special Adobe Connect Server. The link to the e-learning was send to the research team and the experts that were in the video’s. They all commented extensively on the selected video’s and specifically on the text that accompanied the scenario’s. When all experts agreed to the final version, the module was pilot tested among mental health professionals that were involved in the development of the guideline. All in all, the module was developed in half a year, demonstrating it is possible to develop a first version of an e-learning module without a team of experts in a short period of time. A short translated demo is available as Multimedia Appendix. Table 1 presents an overview of the structure, learning goals and guideline recommendations addressed in the module.
Table 1: content of the e-learning module

<table>
<thead>
<tr>
<th>STRUCTURE OF MODULE</th>
<th>LEARNING GOALS</th>
<th>GUIDELINE recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>• Introduction to content and use of the module</td>
<td></td>
</tr>
<tr>
<td>Scene 1: An interaction between a nurse and a chronically depressed patient who has been in a mental health hospital for a long time</td>
<td>• Making contact • Openly discussing suicidality • Validation of emotion • Asking for hopelessness</td>
<td>I, IV</td>
</tr>
<tr>
<td>POWERPOINT LECTURE: Explanation of the model of suicidal behavior as used in the guideline</td>
<td>• To gain insight in the stress-vulnerability-entrapment model • To learn how to structurally assess suicidality • To obtain examples of protective and risk factors</td>
<td>I, V</td>
</tr>
<tr>
<td>Scene 2: A young man, who was just brought in by the police because he was walking by the rails, is being assessed by a nurse</td>
<td>• Making contact • Asking about hopelessness • Asking about the future</td>
<td>I, IV</td>
</tr>
<tr>
<td>POWERPOINT LECTURE: on the basic recommendations of the guideline</td>
<td>• Introduction of the five main themes of the guideline</td>
<td>I, III, IV, V</td>
</tr>
<tr>
<td>Scene 3: interaction between a nurse and a young girl who asks to be hospitalized</td>
<td>• Safety of the patient • Making contact • Openly discussing suicidality</td>
<td>I, II</td>
</tr>
<tr>
<td>POWERPOINT LECTURE: on the topic of safety from the viewpoint of a nurse</td>
<td>• Safety of a patient • Continuity of care</td>
<td>I, II, IV</td>
</tr>
<tr>
<td>Scene 4: Elderly man with death wish has a consultation with a psychiatrist</td>
<td>• Making contact • Assessing somatic problems • Asking for hopelessness • Assessing the occurrence of a depression • Offering a compromise between the death wish of the patient and the options of the doctor</td>
<td>I, V</td>
</tr>
<tr>
<td>Scene 5: Psychotic young man has consultation with his psychiatrist after his coach is worried about his suicidality</td>
<td>• Making contact • Involving significant other • Admitting the patient to a hospital</td>
<td>I, II, III, IV</td>
</tr>
<tr>
<td>Scene 6: Consultation in a hospital of a young woman after suicide attempt</td>
<td>• Making contact • How to get back on track after a suicide attempt • Safety of the patient</td>
<td>I, II, V</td>
</tr>
</tbody>
</table>

Summary of the recommendations: I, II, III, IV, V

Results of post-hoc analysis: I, II, III, IV, V

Figure 1: Participation and use of the e-learning module

In the intervention condition 518 professionals were invited to participate in the study. 411 finished baseline and therefore also received the password and link to the e-learning module. 224 professionals answered questions on the e-learning module at 3 months follow-up. Of those, 55% (n = 122) stated they used the e-learning module for an average time of 40 minutes (SD = 18). When comparing scores on guideline adherence at 3 months follow-up, no effect of the e-learning module above and beyond the face-to-face training was found (b = -2.6, CI 95% (-0.21 – 5.4), p = 0.065).

No significant differences in baseline scores between users and non-users were found (table 2).

Table 2: Results of the logistic regression tests of the baseline characteristics as predictors of e-learning module use

<table>
<thead>
<tr>
<th>Baseline variables:</th>
<th>Users n=122</th>
<th>Non users n=102</th>
<th>Odds(95%CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>79 (64%)</td>
<td>71 (69%)</td>
<td>0.58 (0.294-1.1)</td>
<td>0.12</td>
</tr>
<tr>
<td>Age mean (SD) yrs</td>
<td>43 (11)</td>
<td>43 (11)</td>
<td>0.98(0.934-0.03)</td>
<td>0.36</td>
</tr>
<tr>
<td>Professional discipline</td>
<td>1.37(0.66-2.8)</td>
<td>0.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse*</td>
<td>81 (65)</td>
<td>57 (54)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychiatrists</td>
<td>31 (32)</td>
<td>31 (32)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>16 (12)</td>
<td>14 (13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skills of participants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice experience mean (SD) yrs</td>
<td>18.9 (11.5)</td>
<td>18.2 (11.4)</td>
<td>1.04(0.97-1.17)</td>
<td>0.27</td>
</tr>
</tbody>
</table>
Experience with suicidal behavior mean (SD) yrs
13.6 (10.3) 13.8 (10.4) 0.97 (0.92-1.02) 0.24

Previously trained in discussing suicidal behavior (YES)
24 (19) 21 (20) 1.29 (0.75-2.25) 0.36

Guideline adherence range 1-100
63.3 (9.2) 64 (9) 1.00 (1.00-1.00) 0.73

N(%) unless otherwise noted.

*Reference group

The ICT environment of all 9 mental health institutions (MHI) was insufficient to display the module. Three institutions recently changed their network to "Citrix", so videos were displayed but with no sound. Six reported to have no soundcard or boxes in their computers. In one MHI, the browsers were outdated, but employees had no administration rights to update any browser.

User evaluation

Table 3 shows that 77% stated they learned a lot on the topic of suicide prevention, 87% found the e-learning a good addition to the training, and that 78% would recommend the e-learning module to their colleagues. Thirty percent (n = 42) said they learned more from the module than from the small group interactive training.

Table 3. Evaluation of the e-learning module by user (n = 122).

<table>
<thead>
<tr>
<th>Item</th>
<th>No</th>
<th>Neutral</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I learned a lot on the topic of suicide prevention from the module</td>
<td>8 (7)</td>
<td>19 (16)</td>
<td>95 (77)</td>
</tr>
<tr>
<td>The module is a good supplement to the training</td>
<td>4 (3)</td>
<td>13 (10)</td>
<td>105 (87)</td>
</tr>
<tr>
<td>I feel more secured when dealing with suicidal patients because of the e-learning module</td>
<td>18 (15)</td>
<td>27 (23)</td>
<td>77 (62)</td>
</tr>
<tr>
<td>I would recommend the e-learning module to college’s</td>
<td>11 (9)</td>
<td>17 (13)</td>
<td>104 (78)</td>
</tr>
<tr>
<td>I learned more from the e-learning module than from the training</td>
<td>45 (38)</td>
<td>37 (32)</td>
<td>40 (30)</td>
</tr>
</tbody>
</table>

Discussion

To facilitate developers of e-learning modules in mental health we evaluated an e-learning module that was part of Train-the-Trainer program on the assessment and treatment of suicidal behavior. Importantly, no beneficial effect of the use of the e-learning module above and beyond the face-to-face training was found. This was unexpected because blended learning has been found to be more effective when compared to only face-to-face learning. As we did not randomize access to the e-learning module, we do not know if the guideline adherence scores at follow-up of the participants who used the module would have been lower if they would not have had access to the module. As 77% stated they learned a lot from the module, and 30% stated to have learned more from the e-learning module than from the training, this might be the case. Also, as all professionals are likely to have improved in suicide prevention skills after the face-to-face training, our non-findings might indicating a ceiling effect of our self-constructed guideline adherence scale.

We found baseline characteristics such as age to not indicate future use of the module. This might be explained by studies indicating that the level of computer literacy is high among higher educated participants, no matter what age or gender they have.

An important finding was that problem with hardware, software and security levels in all of the 9 mental health care institutions troubled access to the e-learning module. Videos could not be opened and if they could be opened sound boxes were often lacking. Different solutions were tried per MHI, either by providing free earphones or by bypassing security. In most MHI’s, the best solution was to let the participants complete the module at home. However, not all professionals were willing to access the module at home, unless they were being compensated for working at home.

Technical realization

We demonstrated that to develop the first prototype of an e-learning module, no expert team of computer scientists is necessary. With relative little means, no specific programming knowledge, an enthusiastic PhD candidate and good actors, we developed an acceptable and highly appreciated e-learning module. We do argue that expert knowledge might have helped to anticipate the technical difficulties within mental health institutions. Also, when implementing an e-learning module after the study on a larger scale, expert knowledge is required to make the module more interactive.

Strengths and limitations

Offering the e-learning module as non-required, and having several ICT problems may have caused possibly introduced selection bias, as professionals who were strongly affiliated to the theme of the study or who had interested in e-learning might have been more likely to use the module. Also, the nature of our design does not allow us to drawn any casual conclusions on the effectiveness of e-learning. Finally, we used a non-validated scale as a primary outcome, which makes it difficult to put the findings in perspective.
Our study is the first to extensively report on the development and feasibility of an e-learning module on suicide prevention practice guideline adherence. Most studies on e-learning are done amongst (undergraduate) students. By evaluating our module among a wide range of professionals from many different psychiatric departments, our findings add new and generalizable information for e-learning developers.

Implications and future studies

Although the e-learning module was highly appreciated, no differences on outcomes between users and non-users were found. Future studies in which a person is randomized to either a face-to-face training, an e-learning module or to a blended intervention could further investigate the effect of e-learning on suicide practice skills. Importantly, the scale to assess the primary outcome, guideline adherence, was developed for this study and has not been validated elsewhere. As professionals stated they learned a lot from the module, the non-findings of our study might be attributed to the non-responsiveness of our guideline adherence scale. Future studies should use validated outcome measures to assess change in suicide practice skills.

As is done more often, even without any direct evidence of its effectiveness, our module is currently being implemented among 30 mental health institutions from the Netherlands via the GGZ-Ecademy (ggzecademy.nl). The GGZ-eacademy incorporated the content and structure of our module and applied their format and educational experience to improve the module. The new module is currently available to over 30,000 mental health professionals all throughout the Netherlands. It has been noted that e-health research cannot keep up with technological advances and implementation of online innovation. Standard scientific designs such as a randomized controlled trial are argued to be incapable of offering the information needed in the field of e-health. Therefore, in collaboration with the GGZ-eacademy we strive to test the efficacy of the e-learning module using more responsive and pragmatic designs such as a stepped wedge design. An often used argument for the use of e-learning is its cost-effectiveness. Medical education is expensive, and via e-learning costs can be reduced. However, there is a lack of studies examining the cost-effectiveness of e-learning.

References

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