Acknowledgement: The project PRO-YOUTH (Promotion of young people’s mental health through technology-enhanced personalization of care) is co-financed by the European Commission in the Health Programme (Contract No: 20101209; www.pro-youth.eu)
FOREWORD

This report introduces the European initiative ProYouth and the status of its translation, implementation, and dissemination within the target regions across seven European countries. The document corresponds to Deliverable #6 of the project PRO-YOUTH, which received funding from the European Commission in the Health Programme (Contract No: 20101209; www.pro-youth.eu). The report has been prepared following completion of the second year of the project (March 2013). It is complemented by three publications, which are listed at the end of this document.

1 BACKGROUND AND AIMS OF THE PROJECT

Mental illness accounts for a considerable proportion of the disease burden in Europe and for a growing proportion of the associated direct and indirect costs. Eating disorders such as anorexia nervosa, bulimia nervosa, and binge eating disorders are severe and often chronic mental illnesses that mainly develop during adolescence and young adulthood. Eating disorders are associated with higher mortality rates than any other mental illness. In addition to the psychological and physical impairment, affected individuals experience a substantial loss of quality of life, social isolation, and reduced academic achievements and professional performance.

Based on this background, the overall aim of the ProYouth initiative is the enhancement of mental health of adolescents and young adults through the integration of health promotion, prevention, early identification, and appropriate treatment of eating disorder related impairment. To this end, an Internet-based program (the “ProYouth online platform”) was developed and in implemented across several European countries. The ProYouth initiative aims at the sustained implementation and broad dissemination of the online platform so that a large population of young people may benefit from its availability.
2 PROYOUTh Partners

The following partners from seven countries have been involved in the initiation of the ProYouth initiative:

- Center for Psychotherapy Research, University of Heidelberg, GERMANY
  (PI: Stephanie Bauer)
- Department of Psychiatry, Charles University, Prague, CZECH REPUBLIC
  (PI: Hana Papezova)
- Center for Health Policy and Public Health, Cluj-Napoca, ROMANIA
  (PI: Razvan Chereches)
- Studi Cognitivi S.R.L., Milan, ITALY
  (PI: Giovanni Ruggiero)
- Trinity College, Dublin, IRELAND
  (PI: Deirdre Flynn)
- Institute of Behavioral Sciences, Semmelweis University, Budapest, HUNGARY
  (PI: Irena Szumska)
- Center for Eating Disorders Ursula, Leiden, NETHERLANDS
  (PI: Eric van Furth)

Each of the partners’ teams use multiple strategies to inform the target group of young people about the ProYouth initiative. These strategies include promotion via flyers, posters, presentations, public events, online media, social media, and traditional media.

In addition to the initiators of the project PROYOUTh, partners from two other countries (Turkey and France) have decided to join the initiative. Thus, the online platform is currently available in nine languages. Development and programming was conducted by the coordinator’s team (Center for Psychotherapy Research, Heidelberg) based on previous work in the field of e-mental health. The teams of each partner institution translated the software and content into their respective languages and received training in the administration of the platform by the coordinating team.
3 THE PROYOUTH INFORMATION AND SUPPORT PLATFORM

The ProYouth online platform seeks to provide young people easy, low-threshold, and anonymous access to quality information and to online support tools. The aim is to strengthen young people’s self-management skills, to counteract the development of eating disorders, and to facilitate access to professional care if needed. This should reduce the number of individuals affected by eating disorders and minimize the burden and duration of suffering for those affected.

The platform is freely accessible via different devices (computer, smartphone) in the above mentioned languages through the website www.proyouth.eu:

![Figure 1. Start page of the ProYouth online platform (www.proyouth.eu)](image)

The online platform addresses the following specific objectives:

a) Educate about mental health, eating disorders, and treatment:

The platform provides comprehensive evidence-based information on the various eating disorders, typical symptoms, and early signs of the illness. In addition, the platform informs young people about treatment options and characteristics of mental healthcare in the respective country. These materials serve to improve participants’ mental health literacy and to counteract public and personal stigma associated with eating disorders. In addition to the static information materials, moderators of the platform continuously upload information to a “News” section (e.g.,
links to newspaper articles or online resources) to provide new and relevant information on a regular basis.

b) Assist young people in detecting problematic attitudes and behaviors:

The platform offers an online screening questionnaire that assesses eating disorder related risk factors, attitudes, and behaviors. Upon completion, participants automatically receive a feedback message commenting on the screening results. Depending on individuals’ entries in the screening questionnaire, the feedback message recommends them to register for participation in ProYouth (e.g. in case that they report an increased risk for eating disorders or slight symptoms of the illness). If severe impairment is reported in the screening, the feedback message encourages participants to consider seeking professional support and informs them that they may still register to the platform and receive expert advice. At the same time it is clearly stated that participation in ProYouth cannot replace clinical diagnosis or treatment. Finally, participants who do not report any impairment related to risk factors or eating disorder symptoms in the screening receive the feedback that based on their entries there is no need for them to participate in ProYouth but they are still invited to register if they are in need of information or support.

Following completion of the screening questionnaire, individuals may register for participation by choosing a username, providing an email address, and agreeing to the terms of use. After registration, participants receive an email including a link to activate their user account. Following the activation of their account, participants have access to all modules of the platform which they may use depending on their individual needs and preferences. Also, they are automatically signed up to the monitoring system of ProYouth, i.e. continuously throughout their participation they receive emails including a link to a brief questionnaire assessing attitudes, behaviors, and their level of impairment over time. Supportive feedback on symptoms, as well as positive and negative changes, is provided to participants after each completion of a questionnaire, which is supposed to strengthen their self-management skills.

The monitoring system which tracks participants’ development over time also serves as key steering instrument of the platform. Whenever participants’ entries meet pre-defined criteria indicating severe impairment, online counselors are automatically alerted by the system which allows them to contact these individuals personally via email. This combination of automated and personalized processes ensures that large samples can use the monitoring system despite limited personal resources.

c) Provide peer and professional support:

Online forums allow participants to interact with each other, discuss various topics, ask questions, and provide support to each other. The forums are moderated, i.e. moderators (e.g. trained students) read all postings in the forums on a daily basis, reply to participants’ questions, and make sure that a positive communication atmosphere is maintained (e.g. by deleting inappropriate postings).
Furthermore, on a regular basis online counselors offer chat sessions to provide expert advice and professional support to participants. Chat sessions are conducted in both a group setting and an individual setting. Group sessions last 60 minutes and are offered at regular intervals (e.g. once a week) in order to enable participants to talk to each other, to ask questions, and provide feedback and support in synchronous communication (in contrast to the asynchronous communication in the forums where replies to postings are not received immediately). Online counselors moderate the communication in the chat room, answer questions, and give advice to participants. In addition to the group sessions, counselors provide several individual chat sessions per week that participants can book in advance, i.e. they can choose a 30-minute appointment from an online schedule and meet a counselor in a one-to-one chat setting. Counselors may also initiate individual chat sessions from their side. Whenever they get the impression that a participant experiences substantial impairment (e.g. based on the participant’s entries to the monitoring system or postings to a forum), they contact this individual via email and encourage him/her to engage in a chat session in order to explore the need for more intense support and motivate him/her to actually seek such support.

d) Facilitate access to regular care (e.g. counseling, treatment):

In case of occurrence of severe self-reported eating disorder symptoms, participants are encouraged to utilize regular mental healthcare. If needed, online counselors support them in getting access to such regular care (e.g. by addressing concerns that may prevent participants from seeking in-person help and by providing information on treatment modalities, contact details of providers, etc.).

A major innovation of the ProYouth approach is that (unlike all other eating disorder prevention programs) it is not a fixed-intervention approach, i.e. it is not expected that participants utilize the program to the same extent/duration. In contrast, ProYouth flexibly informs and supports participants depending on their individual needs. Participants receive feedback on the level of support that might be most appropriate for them.

While other approaches target either healthy individuals (for health promotion and universal prevention) or individuals with increased risk or slight symptoms of the illness (for selective and indicated prevention) or individuals with substantial impairment (for self-help, counseling, and treatment), young people may join the ProYouth initiative independent of their eating disorder related health status. The ProYouth initiative innovates through the integration of different levels of care connecting health promotion, prevention, early intervention, and treatment.
4 STATUS OF IMPLEMENTATION AND DISSEMINATION

Implementation and dissemination activities of the ProYouth initiative include face-to-face activities involving young people (e.g., workshops in high schools) and stakeholders (e.g. student counseling services, health authorities) as well as activities via the Internet (e.g., postings to websites, forums), print media (e.g., newspapers, posters, flyers), social media (e.g., Facebook, Twitter), and traditional media (radio, newspaper).

The teams involved in the ProYouth initiative include experts in public health, health promotion and prevention science, technology-enhanced care, and eating disorders. They all have well-established collaborations with regional institutions, organizations, and authorities. Since the launch of the project, all teams have successfully worked towards capacity building and a sound anchoring of the ProYouth initiative within the respective region-specific structures which promises its long-term sustainability and a lasting impact on health care beyond the period of initial funding. For example, collaborations have been initiated with student counseling centers, student unions, high school directorates, school psychologists, prevention activists, health insurances, and providers of conventional care for eating disorders (e.g., counseling centers, hospitals). These efforts are ongoing, so that the ProYouth network is continuously growing as the initiative is adopted by more institutions and organizations, so that lasting effects of its implementation into practice may be expected.

Following the development of the ProYouth online platform and its translation into all teams’ languages, the teams started to implement and disseminate the program in the various target regions. In line with the project’s dissemination plan, by now the ProYouth teams have already approached a total of over 460,000 individuals with information about the initiative.
Figure 2 shows the number of individuals that used the screening tool of the ProYouth online support platform following its launch. In March 2013, already more than 10,000 individuals have used the tool and received feedback on their eating disorder related risk profile. Out of those individuals, more than 4,300 have registered for full access to all ProYouth modules.

Figure 2. Number of individuals that completed the screening of the ProYouth online support platform and number of individuals who registered for utilization of all ProYouth modules.
5 CONCLUSION

Given the numbers above, the ProYouth initiative has by now already involved the largest number of participants in any eating disorder prevention program that has been reported in the literature to date. This achievement is the result of a) thoroughly planned and monitored implementation and dissemination efforts, b) capacity building and ongoing collaborations with various parties and stakeholders and c) the specific concept of the ProYouth approach.

The latter is characterized by a flexible intervention approach that allows young people to use the support tools depending on their individual needs, momentary impairment, and personal preferences. The combination of fully automated modules (e.g. screening, psycho-education, monitoring) and personalized modules (e.g. counseling via online chat) enables providers to address large populations at reasonable cost and effort. Furthermore, the utilization of one joint technological environment (i.e., server infrastructure) provided by the German team limits the cost of the program in other countries to merely the staff time required for managing the online support tools (for online moderators and online counselors).

Implementation and dissemination efforts will continue throughout the remainder of the project so that the reach of the ProYouth initiative is expected to continuously grow over time. This is the prerequisite for the online support platform to have a major impact on public health.

6 FURTHER INFORMATION

As outlined above, the ProYouth online support platform was developed to overcome some of the challenges inherent to other programs for prevention and early intervention in eating disorders. These challenges along with solutions suggested by the ProYouth approach have been described in more detail in the following publications:


Advances in the prevention and early intervention of eating disorders: The potential of Internet-delivered approaches

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KEYWORDS
Eating disorders; Internet; Prevention; Early intervention

Abstract
This paper aims to outline specific challenges inherent to the prevention of eating disorders, to discuss how these might be addressed by Internet-based interventions, and to review currently available approaches. Furthermore, we introduce the European initiative ProYouth which aims at the implementation and dissemination of an Internet-based platform integrating prevention, early detection, and timely intervention related to eating disorders. Overall, the available literature indicates that only a few Internet-based approaches have been studied in the field of eating disorder prevention so far. Results concerning feasibility and acceptability are promising, but only limited evidence is available on efficacy and effectiveness. © 2013 Elsevier GmbH. All rights reserved.

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Introduction

Eating disorders such as anorexia nervosa, bulimia nervosa, and binge eating disorder are serious mental illnesses with an onset that most often occurs in adolescence or early adulthood. They are associated with high levels of impairment, various medical complications, impaired social functioning, and a significantly reduced quality of life (Klump, Bulik, Kaye, Treasure, & Tyson, 2009; Treasure, Claudino, & Zucker, 2010). Many affected individuals experience several episodes of the illness or even a chronic course. The overall burden of illness and cost caused by eating disorders are substantial both on an individual and a societal level. Their treatment is challenging and even for the best available interventions rates of full recovery are often disappointingly low (Watson & Bulik, in press; Shapiro et al., 2007). In addition, the availability, accessibility, uptake, and utilization of evidence-based treatment programs are limited and effective interventions only reach a minority of individuals in need (Hart, Granillo, Jorm, & Paxton, 2011). Overall, it is plausible to assume that successful prevention of eating disorders may result in significant payoffs from a public health perspective (Austin, 2012; Wang, Nichols, & Austin, 2011).

As in other fields, interventions based on information and communication technologies have been increasingly suggested as means to enhance the prevention and treatment of eating disorders. It has been discussed that such interventions may allow us to broadly deliver prevention and treatment programs to currently underserved populations, to reduce barriers to service uptake, and to enhance access to care (Kazdin & Blase, 2011; Simon & Ludman, 2009). However, research into the efficacy, effectiveness and public health impact of technology-enhanced prevention and treatment of eating disorders is still in an early stage (Bauer & Moessner, 2013; Aardoom, Dingemanns, Spinhoff, & van Furth, 2013).

The aim of this paper is to first describe the specific challenges associated with the prevention and early intervention in eating disorders and to illustrate how technology-enhanced programs may help us to address these challenges. In the second part we review existing Internet-based programs for the prevention of eating disorders and the currently available evidence base. Finally, we introduce the European project ProYouth which has been launched in 2011 and seeks to connect several levels of care, i.e., specifically to bridge the gap that typically exists between prevention and early intervention efforts.

Challenges related to prevention and early intervention in eating disorders

Targeting and timing

The etiology of eating disorders is multifactorial. It is assumed that different vulnerabilities (genetic, biological, and temperamental) which interact with environmental components play a role in the development and maintenance of eating disorders (Klump et al., 2009). Review articles have addressed individual, psychological, sociocultural, and biological factors that are associated with an increased risk for the development of eating disorders. Psychological and sociocultural factors that have been suggested as risk factors include, among others, young age, female gender, overconcern with weight and shape, elevated drive for thinness, low self-esteem, perfectionism, thin-ideal internalization, and body dissatisfaction (e.g., Jacobi, Hayard, de Zwaan, Kraemer, & Agras, 2004; Stice, 2002; Striegel-Moore & Bulik, 2007). Furthermore, the engagement in restrictive eating behaviors (e.g., dieting, fasting) and compensatory behaviors (e.g., use of laxatives) have been discussed as risk factors. However, these factors are difficult to differentiate from early signs of the illness, i.e., from actual eating disorder symptoms.

Despite the fact that our knowledge about risk factors has improved substantially over the past 2 decades, there is a clear need for further prospective longitudinal research investigating the interplay of different types of (e.g., sociocultural and biological) risk factors (Striegel-Moore & Bulik, 2007). Even though there is empirical evidence that some specific factors, such as the ones mentioned above, are associated with an increased risk for eating disorders, the predictive power of most of these factors is limited and would probably be even weaker when tested in the framework of comprehensive etiologic models integrating biological, psychosocial, and environmental factors. The testing of such models is urgently needed in order to enhance our
knowledge on risk and causal factors associated with eating disorders (Striegel-Moore & Bulik, 2007). In the meantime, our current risk factor models do not allow us to reliably predict who will develop an eating disorder, let alone at which timepoint illness onset will occur.

This fact challenges the identification of risk groups and the exact targeting and timing of prevention efforts and questions the suitability of fixed-intervention approaches in which the identical type and dose of intervention is assigned to all participants at one specific timepoint. Internet-based interventions may make an important contribution here as they enable us to support participants flexibly by tailoring the type and intensity of support to participants’ individual needs. Furthermore, programs delivered via the Internet can be made available to young people on a longer term, i.e., individuals can access them whenever they experience eating disorder related impairment.

The transition from prevention to early intervention

The prevention of illness onset is an ambitious aim. Realistically, in prevention research, we need to have strategies in place when our programs are not successful, i.e., when prevention fails. When illness onset may not be prevented we should aim for assigning individuals as early as possible to the most suitable therapeutic approach in order to limit the duration of illness. The early detection of the illness and timely treatment are considered crucial not only to limit the duration of suffering, but also to maximize the chances for full recovery.

As a review by Hart et al. (2011) pointed out, however, the reach of expert care for eating disorders is extremely limited. Only a small subgroup of individuals affected by an eating disorder ever seek appropriate professional support and in many cases help-seeking is significantly delayed. It is assumed that various factors contribute to this situation. While in some healthcare systems, there may be a lack of treatment facilities and trained eating disorder experts or cost associated with treatment may be high and thus prevent individuals from accessing treatment, there are other factors that apply across countries and healthcare systems. Such universal barriers to help-seeking include a lack of mental health literacy (i.e., a lack of knowledge on eating disorders, symptoms and treatment options) and stigmatization around mental illness in general and eating disorders specifically (Mond et al., 2010; Rohrig & McLean, 2010). More than in other conditions (e.g., depression), eating disorders are considered choices and habits that individuals could simply give up or overcome on their own. Many people do not consider them serious conditions that require professional treatment (Ebneter & Latner, 2013).

Prevention programs may contribute to overcoming psychosocial distances, such as shame, uncertainties and self-stigma, that many affected individuals experience especially prior to seeking professional treatment for the first time. However, the transition from preventive efforts to those that aim at an early intervention has been mostly neglected in eating disorder research so far. Technology-enhanced programs offer unique opportunities here and may help to better integrate education, prevention, early detection and early intervention around eating disorders by providing anonymous support and by applying screening and monitoring procedures that allow to track eating disorder related attitudes and behaviors continuously over time and to flexibly recommend the appropriate level of care (Bauer & Moessner, 2012). Such programs may provide participants with relevant information and communication tools, but also enhance their self-management skills and encourage them to seek adequate professional help when they need it.

Implementation, dissemination, and sustainability

Another key challenge in prevention (and treatment) research is the sustained implementation and dissemination of programs. Even following successful evaluation, the transfer of innovative interventions to real world settings and routine care often fails. Major threats to the longevity and sustainability of programs include a lack of resources (both personal and financial) to support the transition from research to practice as well as a lack of adequate infrastructure and links between researchers, stakeholders, and the community (Black Becker, Stice, Shaw, & Woda, 2009).

In contrast to face-to-face delivery, Internet-based interventions have the advantage that trained staff may manage and coordinate them centrally and thus, interventions may be disseminated in identical format to large target populations for extended periods of time independent of geography.

Internet-based prevention programs

In the following we describe examples of Internet-based interventions that have been developed for the prevention and early intervention in eating disorders and review the currently available evidence base.

The first Internet-based program that has been introduced and studied most extensively is the program Student Bodies. Student Bodies is a structured cognitive-behavioral (CBT) program for college-age women at risk of developing an eating disorder. The program includes moderated online discussion groups about eating disorder attitudes and behaviors. Participants are expected to work through the modules over a period of eight weeks. The program has been evaluated in a series of studies in the US and Germany. In both countries, significant effects of the intervention on weight and shape concerns in at-risk samples have been found (e.g., Zabinski, Wilfley, Calfas, Winzelberg, & Taylor, 2004; Taylor et al., 2006; Jacobi et al., 2007). However, in the most rigorous study using illness onset as outcome criterion, the efficacy of the program could not be confirmed; Taylor et al. (2006) conducted a randomized controlled trial allocating 480 college-age women to the Student Bodies intervention or a control condition. The results did not show a significant difference in illness onset rates between intervention and control group. However, subsequent moderator analyses indicated that the Internet-based program reduced the onset of clinical and subclinical eating disorders in participants who either had an elevated body mass index or reported compensatory behaviors at baseline (Taylor et al., 2006).
Student Bodies was developed as an Internet-based intervention from the outset. In contrast, other interventions were originally delivered without the use of technology in the face-to-face context and transferred to the online setting in the next step. So far, two studies have directly compared face-to-face and online delivery modes in empirical studies. Paxton, McLean, Gollings, Faulkner, and Wertheim (2007) evaluated the effects of the face-to-face and Internet-based version of the program Set Your Body Free (Gollings & Paxton, 2006) compared to a control condition in a sample of 116 women. Set Your Body Free is an 8-week therapist-led intervention addressing body dissatisfaction and problematic eating behaviors. Both versions of the program led to more favorable outcomes than the control condition. However, a larger study is needed to finally determine to which extent the effects of both delivery modes are equivalent (Paxton et al., 2007).

The same is true for the evaluation of a recently developed version of a dissonance-based prevention program, the Body Project (Stice, Rohde, Durant, & Shaw, 2012). A number of studies showed that the 4-week face-to-face intervention may reduce eating disorder risk factors and prevent illness onset in young women who are at risk for an eating disorder (e.g., Stice, Marti, Spoor, Presnell, & Shaw, 2008; Stice, Rohde, Shaw, & Gau, 2011). The online version (eBody Project) consisting of six modules with similar content as the face-to-face intervention was developed to enhance the reach of this intervention. In the recent comparative study the effects observed for the online version and the face-to-face version of the program delivered in group format did not differ (Stice et al., 2012). Given the small sample size \( n = 19 \) participated in the online intervention and \( n = 39 \) participated in the group-based face-to-face intervention) and the prototype character of the online intervention, these findings have to be considered preliminary in nature.

All of the online interventions described above use mostly standardized and manualized approaches in which all participants receive the identical dosage of the intervention, i.e., all participants are asked to engage in the same modules for the same duration. Assuming that a more flexible approach may better fit the heterogeneous needs of participants with respect to intensity of support, the Internet-based program Essprit was developed (Bauer, Moessner, Wolf, Haug, & Kordy, 2009). Essprit includes screening and monitoring modules that assess eating disorder related attitudes, and behaviors and provide tailored feedback to participants whenever they complete an online assessment. In addition, online forums and chat modules facilitate discussions with other participants and online counselors. The feasibility and acceptance of the program has been studied in college samples in Germany (Bauer et al., 2009) and Ireland (Lindenberg, Moessner, McLaughlin, Harney, & Bauer, 2011).

An adapted version of the program for high school students (YoungEssprit) was used in a prospective RCT investigating whether the intervention is efficacious in reducing the onset of self-reported eating disorder symptoms within 12 months after study entry. The sample included 1667 high school students that were recruited in two waves \( n = 896 \) and \( n = 771 \). The results of the efficacy analyses were mixed: findings from the first recruitment wave pointed to a preventive effect of the intervention with 9.6% of participants in the control group and 5.9% of participants in the intervention group developing eating disorder related symptoms within 1 year after study entry. However, in the second recruitment wave intervention and control group did not differ (Lindenberg & Kordy, in preparation). An enhanced version of the program has been implemented as part of the initiative ProYouth which we describe in more detail in the following.

The European initiative ProYouth

Objectives and modules

The overall objective of the ProYouth initiative is the promotion of mental health of young people through an Internet-based platform integrating prevention and early intervention related to eating disorders. The platform provides young people access to quality information and online support tools to counteract the development of eating disorders. Furthermore, it aims to facilitate access to professional support and routine healthcare if needed. The platform is freely accessible via different devices (computer, smartphone) in several languages through the website www.proyouth.eu and addresses the following specific aims:

(a) Educate about mental health, eating disorders, and treatment: The platform provides information materials on eating disorders (e.g., on symptoms, risk factors, and early signs of the illness) and treatment options. Furthermore, moderators upload information to a “News” section several times per week, in order to continuously provide new and relevant information to participants. Information and materials in these sections of the platform serve to improve participants’ mental health literacy and to counteract public and personal stigma associated with eating disorders.

(b) Assist young people in detecting problematic attitudes and behaviors: The platform offers an online screening questionnaire that assesses eating disorder related risk factors, attitudes, and behaviors. Upon completion, participants automatically receive a feedback message commenting on the screening results. In case that participants report an increased risk for eating disorders or slight symptoms of the illness in the screening questionnaire, the feedback message recommends them to register for participation in ProYouth. In case that they report severe impairment in the screening questionnaire, the feedback message encourages them to seek professional help and informs them that they may still register to the platform and receive information, expert advice, and peer support in an anonymous setting. At the same time it is clearly stated that participation in ProYouth cannot replace clinical diagnosis or treatment. Finally, participants who do not report any impairment related to risk factors or eating disorder symptoms in the screening questionnaire receive the feedback that based on their entries there is no need for them to participate in ProYouth but they are still invited to register if they are in need of information or support.
In order to register for participation in ProYouth, individuals need to choose a username, provide an email address, and agree to the terms of use once they completed the screening questionnaire. After registration, participants receive an email including a link to activate their user account. Following the activation of their account, participants have access to all modules of the platform which they may use depending on their individual preferences. Also, they are automatically signed up to the monitoring system of ProYouth, i.e., on a regular basis they receive an email asking them to complete a brief online questionnaire measuring current attitudes, behaviors, and level of impairment. Supportive feedback on the current status, as well as on positive and negative changes, is provided to participants after each completion of a monitoring questionnaire, which is supposed to strengthen their self-management skills.

The monitoring system which tracks participants’ development over time also serves as a steering instrument of the platform. Whenever participants’ entries meet pre-defined criteria indicating severe impairment, online counselors are automatically alerted by the system which allows them to contact these individuals personally as described below. In light of limited resources (e.g., staff support), this combination of automated and personalized processes ensures that a large number of participants can be included in the program.

(c) Provide peer and professional support: Online forums allow participants to talk to each other about various topics, to ask for information, and to provide support to each other. The forums of the ProYouth platform are moderated, i.e., moderators read all new postings in the forums on a daily basis and reply to participants’ questions as appropriate. In their replies, moderators may also direct participants to specific sections of the ProYouth platform where they may find additional information related to their question. Furthermore, on a regular basis online counselors offer chat sessions to provide expert advice and professional support to participants. Chat sessions are conducted in both a group setting and an individual setting. Group sessions last 60 min and are offered at regular intervals (e.g., once a week) in order to enable participants to talk to each other, to ask questions, and provide feedback and support in synchronous communication (in contrast to the asynchronous communication in the forums where replies to postings are not received immediately). Online counselors moderate the communication in the chat room, answer questions, and give advice to participants. In addition to the group sessions, counselors provide several individual chat sessions per week that participants can book in advance, i.e., they can choose a 30-min appointment from an online schedule and meet a counselor in a one-to-one chat setting. Counselors may also initiate individual chat sessions from their side. Whenever they get the impression that a participant experiences substantial impairment (e.g., based on the participant’s entries to the monitoring system or postings to a forum), they contact this individual via email and encourage him/her to engage in a chat session in order to explore the need for more intense support and motivate him/her to actually seek such support.

(d) Facilitate access to regular care (e.g., counseling, treatment): In case of occurrence of severe self-reported eating disorder symptoms, participants are encouraged to utilize regular mental healthcare. If needed, online counselors support them in getting access to such regular care (e.g., by addressing concerns that may prevent participants from seeking in-person help and by providing information on treatment modalities, contact details of providers, etc.).

Evaluation of the ProYouth initiative

The ProYouth initiative is supported by the European Union’s Health Programme and aims at the broad and sustained implementation of the online platform in various target regions. Similar to the previous version of the platform which focused mostly on college (Bauer et al., 2009; Lindenberg et al., 2011) and high school samples (Lindenberg & Kordy, in preparation), the ProYouth platform addresses primarily the age groups of adolescents and young adults. However, since the ProYouth platform is disseminated through online channels (e.g., social media, forums, mailing lists), print media (e.g., posters, flyers, newspapers) and face-to-face activities (e.g., workshops in schools), it approaches larger, more diverse, and more heterogeneous populations than previous programs.

So far, it is unknown how Internet-based eating disorder prevention programs may be delivered most successfully with respect to both reach and cost. ProYouth is the first project that addresses this question and aims to identify best-practice, cost-effective strategies for the implementation and dissemination of an online platform in the field of eating disorders. Other research priorities of the ProYouth network concern the acceptability, and reach of the Internet-based platform in specific target populations (e.g., minority groups such as young people with migration background) and in various healthcare systems. Finally, the effect of the online platform with respect to the reduction of barriers that prevent individuals from seeking professional help is investigated (e.g., Does participation in ProYouth improve mental health literacy?) and the potential of the platform to facilitate timely access to routine care is explored (e.g., Does participation in ProYouth enhance the willingness to seek professional treatment when needed?).

Implications for future research

Research on Internet-based prevention of eating disorders is still in the beginning. Promising findings concerning the acceptability and feasibility of several Internet-based approaches targeting risk factors and eating disorder related symptoms and behaviors have been reported. However, only two adequately powered RCTs investigating the efficacy of such approaches have been completed and the results of both of these studies have not convincingly
confirmed the postulated effects of these programs in terms of prevention of illness onset (Taylor et al., 2006; Lindenberg & Kordy, in preparation).

Based on the current evidence base, several implications concerning future developments and research may be derived. Most importantly, more rigorous empirical evaluation of Internet-based prevention programs is needed, i.e., the potential of prevention programs needs to be demonstrated in efficacy, effectiveness, and dissemination trials (Flay et al., 2005; Marchand, Stice, Rohde, & Black Becker, 2011; Polanczyk, 2011). Such research should also include currently understudied populations such as males or individuals with different ethnic and cultural backgrounds. Furthermore, the issues of reach and cost of these interventions need to be explicitly addressed. In the majority of publications on Internet-based prevention, the authors state that their interventions would be easy to disseminate, and reach large and diverse populations of young people and as well as that Internet-based delivery would be cost-effective. However, no study has actually investigated these issues. Similarly, so far, it remains an open question how and by whom such programs should be implemented and disseminated in order to reach the maximum number of individuals in the most efficient way. Possible channels for dissemination include promotion of programs through high schools, colleges, community healthcare providers, internet, social media, and traditional media.

Furthermore, it is currently largely unknown who benefits from Internet-based prevention programs and how these interventions actually work. The fact that information on participants’ adherence and utilization of different modules is documented automatically in Internet-based programs (e.g., number, frequency, and duration of logins, time spent on specific pages) and participants’ impairment may be tracked easily over time, facilitates research into predictors and mechanisms of change as well as analyses of the process-outcome relationships (Bauer & Moessner, 2012). In the field of Internet-based prevention of eating disorders, so far only one study has explored such questions (Manwaring et al., 2008).

A related issue concerns the question how much involvement of moderators, clinicians or other healthcare professionals is needed to deliver Internet-based prevention programs. The amount of professional time and the degree of professional training that the delivery requires have major impact on the cost and sustainability of a program. As illustrated above in the context of the ProYouth platform, Internet-based programs allow us to flexibly integrate automated and personalized modules in order to serve the maximum number of users in light of limited resources. However, more research is needed to determine the optimal level of professional input.

Finally, future research should explicitly address the transition from prevention via early intervention to treatment of eating disorders in order to determine to which extent Internet-based programs may facilitate access to regular healthcare. So far the assumption that such programs may reduce barriers to help seeking in individuals affected by eating disorders remains largely speculative. For example it needs to be investigated whether shame and fear of stigmatization may be reduced and mental health literacy may be improved through Internet-based prevention programs. Similarly, it needs to be studied whether such programs may actually improve participants’ help seeking behaviors, and contribute to a timely uptake of appropriate care if needed.

Conclusion

Interventions based on information and communication technologies play an increasing role in the delivery of mental healthcare for eating disorders (Bauer & Moessner, 2013). Similarly, their impact in the field of prevention of eating disorders is likely to grow in the future. Advances in technology, especially the increasing availability of mobile devices, will further facilitate access to such interventions and promises to extend their reach substantially.

Today, research in this field is still in an early stage and allows us to draw only limited conclusions on the efficacy and effectiveness of specific interventions concerning the prevention of illness onset. However, future developments and rigorous research into the topics outlined in this paper promise to substantially advance the state of the art.

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Chapter 46: Computer-Assisted Approaches to Prevention

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In recent years the field of “e-mental health” (“e” for electronic) has expanded rapidly and the provision of mental health services via technology has become increasingly common. The questions surrounding the specific ways interventions based on information and communication technologies may advance mental health care have been discussed extensively in the literature (Kazdin & Blase, 2011; Simon & Ludman, 2009). In the field of eating disorders (EDs), a number of interventions have been introduced to this end. These include approaches for prevention, guided and unguided self-help, treatment support, and relapse prevention (Aardoom, Dingemans, Spinhoven, & van Furth, 2013; Bauer & Moessner, 2013; Chapter 44).

In this chapter, after presenting the potential advantages of technology-based prevention, we then review the currently available literature on computer-assisted preventive approaches to EDs. In light of that evidence base, we then discuss directions for future development and research.

Advantages of Internet Technology in Prevention

Using technology, especially the Internet, to deliver preventive approaches appears promising for several reasons. These include the fact that such programs can easily be made available to large target populations and that they can be accessed at anytime from anywhere with various devices (e.g., computers, laptops, smartphones). Internet technology allows service providers to deliver programs in a standardized way and to manage the delivery from a distance, that
is, such technology does not require recruitment, training, and supervision of providers in each single location where the intervention is conducted (e.g., high schools or colleges).

Furthermore, technology-enhanced interventions allow for more flexibility compared to traditional approaches in which, typically, each participant would receive the same type, intensity, and duration of a prevention program at one specific point in time. In contrast, in Internet-based approaches, subgroups of participants may be offered specific modules of an intervention (e.g., based on their risk profiles, as determined by a valid on-line screening tool) and the content and dose of the prevention intervention may be adapted continuously based on individuals’ needs throughout the course of participation. Such flexible approaches acknowledge that, despite all the advances in prevention and risk factor research over the past decades, our ability to reliably predict which individual will develop an ED at which point in time remains very limited. As long as the exact causes and risk factors of EDs and their interplay are unknown, the targeting and timing of preventive efforts will remain a challenge (Bulik, 2013). Technology-enhanced interventions may address this challenge by enabling us to better match programs to participants’ individual needs over time rather than assigning the same fixed-intervention approach to all participants.

Another, yet related, advantage of Internet-based prevention programs is that they may facilitate the transition from prevention to early intervention and ensure continuity of care when a preventive program is not sufficient and individuals develop manifest EDs despite their participation in a prevention program. We know that only a minority of individuals who develop an ED seek and receive timely and adequate professional healthcare (Hart, Granillo, Jorm, & Paxton, 2011). At the same time, we know that early diagnosis and timely
treatment are associated with better outcome and a better long-term prognosis (Keel, Mitchell, Miller, Davis, & Crow, 1999; Treasure & Russell, 2011; Chapter 55). When preventive efforts fail and an individual develops an ED, we should thus aim for early intervention that facilitates access to curative treatments (McGorry, 2013). Internet-based preventive approaches provide the opportunity to incorporate components that allow for the timely detection of illness onset and for the reduction of some of the barriers that impede and delay seeking professional help. These barriers include uncertainties, shame, stigmatization, and limited knowledge about ED symptoms and treatment options, that is, a lack of mental health literacy (Mond et al., 2010; Roehrig & McLean, 2010). Research has shown that many individuals consider EDs to be “bad habits” or “misguided choices” rather than severe conditions that require specialized treatment; in fact, compared to other illnesses, these stigmatizing attitudes are more prevalent with respect to EDs (Ebneter & Latner, 2013).

Technology-enhanced programs may enable us to facilitate the transition from prevention to early intervention by providing low-threshold, anonymous information and support tools and by applying automated screening and assessment procedures (Chapter 38) which allow us to monitor ED-related risk factors, attitudes, and behaviors longitudinally. Based on each person’s development over time, we may flexibly recommend specific levels of care to individual participants, for example, encourage them to seek face-to-face professional support if needed (Bauer & Moessner, 2012).

In sum, it is assumed that technology may allow us to efficiently deliver ED prevention programs to large, diverse, and underserved populations, to overcome some of the limitations of traditional preventive approaches, and to better connect the care sectors of prevention and early intervention.
Computer-Assisted Approaches to Prevention of Eating Disorders

Student Bodies

Currently, the best-known and best-studied prevention program based on technology is Student Bodies, developed at Stanford University (California) by C. Barr Taylor and colleagues in the 1990s (Winzelberg et al., 1998; Chapter 44). Student Bodies is an Internet-based structured 8-weeks program based primarily on a cognitive-behavioral approach (Chapters 18 & 56). The intervention consists of weekly psychoeducational readings on various topics (e.g., body dissatisfaction, weight and shape concerns, excessive exercising, and nutrition), cognitive-behavioral exercises, weekly personal writings in an online body image journal, and participation in an asynchronous, moderated online discussion group. As part of the discussion group, participants are expected to post statements about their weekly readings and exercises to a message board and to regularly reply to other participants’ postings. The target group of Student Bodies is college-age women identified as being at risk of developing EDs based on an initial assessment using the Weight Concerns Scale which is a reliable and valid screening instrument (Killen et al., 1996; Chapter 38).

Evaluations of Student Bodies in several studies in the USA and Germany have indicated that the intervention has significant positive short-term effects on body dissatisfaction, weight and shape concerns, and problematic eating behaviors compared with wait-list control groups (Jacobi et al., 2007, Winzelberg et al., 2000; Zabinski et al., 2001). A modified version of the program, including a synchronous, interactive, and moderated support group (based on Internet chat technology), generated to some extent more favorable effects at follow-up than the original version of the program. The authors suggest that more interactive, synchronous communication allows for better and more timely tailoring of
responses to specific needs of participants, which might lead to improved outcome (Zabinski, Wilfley, Calfas, Winzelberg, & Taylor, 2004).

In order to evaluate the longer-term effects of *Student Bodies* on prevention of illness onset, Taylor et al. (2006) conducted a rigorous randomized controlled trial with 480 at-risk college students. Participants were randomized to the Internet-based prevention program or a control group that had the opportunity to participate in *Student Bodies* at the end of the follow-up period. Follow-up assessments were conducted over a period of up to 3 years. In the total sample, survival analyses indicated no significant difference in illness onset rates between the intervention group and the control group (with approximately 9% of study participants developing an ED over the course of follow-up). However, the results confirmed the previously reported significant reductions of weight and shape concerns in the intervention compared to the control group. Furthermore, effects of the program in terms of prevention of illness onset were identified in two subgroups. Specifically, participation in *Student Bodies* was associated with the onset of fewer clinical and subclinical EDs in participants who either showed an elevated body mass index or profound compensatory behaviors at study entry (Taylor et al., 2006).

Recently, two additional versions of *Student Bodies* have been introduced by researchers in Dresden, Germany. “*Student Bodies +*” is an adapted version of the original program that aims at targeted prevention of EDs in women who experience manifest symptoms or even a subclinical version of the illness (Völker, Jacobi, & Taylor, 2012). In a randomized controlled trial with 126 female participants, this program proved to be superior at 6-month follow-up to a wait-list condition in terms of improvements of ED-related attitudes, reductions in binge
eating and purging episodes, and overall abstinence from ED behaviors (Jacobi, Völker, Trockel, & Taylor, 2012).

The second adaptation is “Student Bodies-AN.” It specifically targets women who are considered at risk of developing anorexia nervosa (AN), that is, those who are underweight and report restrictive eating. In addition to adaptations in content to focus on those risk factors, the program was expanded from 8 to 10 weekly sessions for this target group. A recent pilot study showed that Student Bodies-AN is feasible and well-accepted by women who experience weight and shape concerns and have a low BMI and/or restrictive eating behaviors (Ohlmer, Jacobi, & Taylor, 2013).

**Food, Mood, and Attitude**

Whereas Student Bodies was specifically developed for at-risk populations, another computer-based approach, Food, Mood, and Attitude (FMA), was designed to integrate universal and selective prevention (Chapter 41) by targeting individuals at high risk for developing EDs as well as those at low risk (Franko et al., 2005). FMA, created in the USA (Boston), is a 2-hour CD-ROM-based, un-guided (i.e., not moderated) program designed to educate participants and improve their skills with respect to different risk factor areas (e.g., pressure to be thin, thin ideal internalization, body dissatisfaction; Chapter 21). Ideas from multiple theoretical approaches and prevention theories are incorporated into the didactic information materials (presented in text, voice-over, or video), as well as the interactive tools and exercises. FMA is a structured program that requires participants to complete one module after the next without skipping any content.

The program was evaluated in a randomized controlled trial with 240 female students. Compared to a control group, high- and low-risk participants in the FMA program increased their knowledge of risk factors and EDs. Furthermore, in the
at-risk group, participation in FMA resulted in improvements with respect to weight and shape concerns, as well as in a decrease of the internalization of negative social and cultural attitudes towards appearances at 3-month follow-up (Franko et al., 2005).

**Set Your Body Free**

In contrast to Student Bodies and FMA, which were developed initially as computer-based interventions, other programs exist as both face-to-face and technology-enhanced versions of the same intervention. For example, the Australian (Melbourne) targeted prevention program Set Your Body Free (Gollings & Paxton, 2006; Chapter 44) was designed to address body dissatisfaction and problematic eating behaviors in a face-to-face setting. Set Your Body Free is a group-based, 8-week, therapist-led intervention. In the Internet-delivered version, participants meet with a clinician in a chat room for the weekly group sessions. In addition, they have the opportunity to post statements to a message board in-between sessions; thus, the program combines synchronous and asynchronous ways of communication.

In a randomized controlled trial including a 6-month follow-up, the effects of the face-to-face version and the Internet-based version of Set Your Body Free were assessed relative to a control condition. The sample included 116 women aged 18 to 35 years with high levels of body dissatisfaction (assessed with the Body Shape Questionnaire; Cooper, Taylor, Cooper, & Fairburn, 1987 and the Bulimia Test-revised; Thelen, Farmer, Wonderlich, & Smith, 1991; Chapter 38). The results showed that both versions of the intervention program were superior to the control condition, with slightly stronger effects in the face-to-face condition (Paxton, McLean, Gollings, Faulkner, & Wertheim, 2007). However, a larger sample is needed to investigate the equivalence of both delivery modes.
Another face-to-face intervention for targeted prevention which has recently been adapted for delivery via Internet is the dissonance-based prevention program called the *Body Project*. This program was created by Stice and colleagues in the USA (Oregon; Stice, Rohde, & Shaw, 2013). As described in Chapter 44 of this volume, research over the past decade has demonstrated that the 4-week face-to-face version of *Body Project* is efficacious and effective in reducing eating disorder risk factors and preventing illness onset in young females at risk for development of eating disorders (Stice, Marti, Spoor, Presnell, & Shaw, 2008; Stice, Rohde, Shaw, & Gau, 2011).

The online version of the intervention (eBody Project) contains similar content as the face-to-face version and consists of six sessions. Stice, Rohde, Durant, and Shaw (2012) compared the effects of the online version with those of the face-to-face group version and two control conditions (educational video and educational brochure) in a randomized controlled trial with 107 college-aged women ($M = 21.6$ years, $SD = 6.6$) who reported body image concerns during a telephone interview. The results showed greater improvements (pre-post) with respect to ED risk factors and symptoms in the two experimental conditions (group condition and online condition) compared to the two control conditions. Similar effect sizes were obtained via online and face-to-face group delivery of the intervention. However, given the modest sample size in these two experimental conditions ($n = 58$), these findings should be considered preliminary, and more research is needed to determine the potential of eBody Project.
Individually Tailored Prevention and Early Intervention: The Heidelberg Approach

Essprit

In the approaches described above, all participants receive the same intervention package, that is, they are expected to complete the intervention in a predefined timeframe (e.g., 8 weeks) following a mostly standardized procedure. This is not the case for the program Essprit, whose title is an acronym for “Essstoerungspraevention ueber das Internet” (= Eating disorder prevention via the Internet). The development in Germany (Heidelberg) of this program was based on the assumption that, because participants’ needs with respect to intensity and duration of an intervention vary largely, a more flexible and individualized approach may better fit their needs. Therefore, Essprit does not require participants to use specific components or to complete specific modules. Moreover, it does not foresee a minimum or maximum intensity of use or a pre-defined frequency or duration of participation, but rather seeks to provide support more flexibility depending on participants’ needs and preferences (Bauer, Moessner, Wolf, Haug, & Kordy, 2009). Essprit includes psychoeducational components as well as online screening, monitoring tools for tracking relevant factors (e.g., ED-related risk factors and behaviors), and provision of tailored feedback to participants. Additional support tools include online forums and chat modules. Two studies established the feasibility and acceptance of the program in college-age participants in Germany (Bauer et al., 2009) and Ireland (Lindenberg, Moessner, McLoughlin, Harney, & Bauer, 2011).

Based on this initial research, the program was adapted for younger age groups (YoungEssprit). In a recently completed randomized controlled trial, the
developers investigated the efficacy of *YoungEssprit* in reducing the onset of self-reported ED symptoms in a sample of 1667 German high school students (58% female; $M = 13.78$ years, $SD = 1.20$) that entered the study in two separate recruitment waves ($n = 896$ and $n = 771$). The findings were encouraging but to some extent inconclusive. Results from the first recruitment wave indicated a positive effect of the intervention. Within 12 months, the onset of ED-related symptoms was significantly lower in the intervention group (5.9%) than in the control group (9.6%). However, this difference could not be confirmed in the second sub-sample. Findings with respect to uptake of the intervention were positive (98% of participants used the psychoeducational module and about 80% used at least one additional module), with approximately 75% reporting high satisfaction with the program (Lindenberg & Kordy, accepted for publication).

**ProYouth**

The potential of an enhanced version of the programs *Essprit* and *YoungEssprit* is currently being investigated as part of a European Commission initiative entitled “ProYouth,” which seeks to promote the mental health of young people by disseminating an Internet-based platform integrating prevention, early detection, and timely intervention in case of ED-related impairment. Building on *Essprit* and *YoungEssprit* the *ProYouth* information and support platform offers young people easy and anonymous access to information materials and to online support tools in order to prevent development of EDs and to facilitate access to professional care if prevention is not enough. The platform is accessible through the website www.proyouth.eu. It is available in six languages (German, Irish, Italian, Czech, Hungarian, Romanian) and can be accessed via various devices that allow users to connect to the Internet (e.g., computer, laptop, smartphone).
The ProYouth initiative has been co-financed by the European Commission for a period of three years (2011-2014) which allowed the teams in the various countries to offer the program at no cost to participants. Recent analyses based on a German data set show that the cost of providing the program amount to approximately 15 Euro per participant per year if 1000 individuals are registered for participation (Minarik et al., 2013). This amount includes both expenses for technical maintenance (e.g., hardware maintenance, software updates) and for provision of the online support (e.g. staff time to provide chat sessions) based on German salary levels. All teams succeeded in implementing the program in a sustained way, i.e. the program will be available to participants at no cost beyond the initial funding period. This was achieved through a) collaborations with various parties, e.g. student counseling centers or networks of school psychologists that engage in the provision of the online support (i.e., they extend their regular face-to-face service by offering online services through ProYouth) and b) the utilization of one joint technological environment (i.e., server infrastructure) provided by the Heidelberg team which limits the cost of the program in other countries.

As noted above, the main difference between this approach and other computer-assisted approaches to ED prevention is that it is not a fixed-intervention approach. Similar to the FMA program described above, ProYouth integrates universal and selective prevention and allows participants with and without an elevated risk for developing EDs to join. However, based on their specific risk profiles assessed during an initial screening procedure, and based on their development over time as assessed through the monitoring module, participants receive feedback on the level of support that might be most appropriate for them (see below).
One of the main objectives of the ProYouth initiative is implementation and dissemination of the online platform in various target regions. However, given that the program is freely available on the Internet, access is not limited to specific populations. Individuals who access the platform are informed about general issues related to data collection, data protection, and data security via the disclaimer on the website. As soon as they register for participation in the program they have to consent to the terms and conditions of use (by clicking a check box) informing them about issues related to anonymity and confidentiality. Those terms and conditions have been adapted based on national and legal regulations in the respective countries. Participants are encouraged to choose a username that is different from their real name, and they are informed that no conclusions about their identity may be drawn unless they provide such information via their username, email address, or postings on the page. Furthermore, they are informed that any information they provide as part of their participation is kept confidential, and that, once again, data protection, data security, and emergency measures follow the latest recommendations and national guidelines (country-specific details are provided if available).

Specifically, the ProYouth platform contains four modules:

**Didactic information about mental health, eating disorders, and treatment.** The platform provides comprehensive evidence-based information on the various EDs, typical symptoms, risk factors, and early signs of the illness. In addition, the platform informs participants about characteristics of the mental healthcare system in their respective country and about treatment options (including links to online search engines for clinical experts in the field of EDs, if available). Besides static information materials, moderators of the platform upload
information (e.g., links to newspaper articles or online resources) to a “News” section on a regular basis. Overall, this module is designed to improve participants’ psychoeducation, mental health literacy, and help-seeking skills, and to counteract stigma around EDs.

Screening and monitoring. Prior to registering for participation, individuals need to complete an online screening questionnaire including the Weight Concerns Scale (Killen et al., 1996; Chapter 38) and the Short Evaluation of Eating Disorders (Bauer, Winn, Schmidt, & Kordy, 2005) in order to assess ED-related risk factors, attitudes, and behaviors. Once they complete the screening questionnaire, participants automatically receive a feedback message. Depending on the entries, the feedback message directs individuals to register for participation in ProYouth and to use the available online tools, for example, in case they report an increased risk for EDs or slight symptoms of the illness. The feedback message in this case may read as follows:

Thank you for completing the self-test. According to your entries you are more concerned about your weight and shape than other young people. In the longer term such concerns may have a negative impact on your eating behavior which might ultimately result in physical or mental problems or symptoms of an eating disorder. We recommend you to register for participation in ProYouth and take advantage of our various online modules. These include information materials, continuous monitoring of relevant attitudes and behaviors, peer discussions with other participants and student moderators, and chat consultations with experts. After registration, it is totally up to you to decide which modules of ProYouth you wish to use. Your participation is anonymous and free of cost. Please note: ProYouth
provides information and allows you to talk to peers and online counselors via a secure online platform. However, participation in ProYouth cannot replace clinical diagnosis or treatment by healthcare professionals.

In addition to the feedback message, individuals receive instructions how to interpret the message. They are informed that this is an automated message based on their entries in the screening questionnaire, so the message can provide only a rough evaluation of their attitudes and behaviors. Furthermore, they are informed that the screening results do not allow for predictions on an individual level (i.e., that the results do not allow for definite conclusions that an individual will develop an ED in the future), but that the probability of developing ED-related impairment may be increased. They are reminded that a self-test cannot be used for diagnosis, and, finally, they are encouraged to ask specific questions they may have on their feedback message via the contact form on the ProYouth website.

If severe impairment is identified in the screening questionnaire, the feedback message recommends participants to consider seeking face-to-face professional support. Furthermore, the message informs them that they may still consider registering on the platform, for example, in order to talk to experts online, to clarify questions or uncertainties, and/or to seek peer support. Participants whose screening questionnaire responses do not indicate any impairment related to risk factors or ED symptoms receive a feedback message stating that, based on their entries, there is no need for them to participate in such an intervention. However, they are still welcome to register if they wish to search for information or for support for themselves or others. Each feedback message contains an explicit statement that, of course, participation in ProYouth cannot replace clinical diagnosis or treatment.
Following completion of the screening, individuals can decide whether or not they wish to register for participation in the online program. Once they have activated their account, they receive access to all modules of the platform. As part of their participation, they are registered for the monitoring module, which is one of the key components of the platform. Throughout their participation they regularly receive emails, including a link to a brief questionnaire assessing attitudes, behaviors, and development over time. Following each completion of the monitoring questionnaire, participants receive a supportive feedback message commenting on their level of impairment and on positive and negative changes. The monitoring module aims to strengthen participants’ self-management and self-care skills, for example, by encouraging them to seek more intense support in case of increasing symptoms and thus instructing them to take an active role in the management of their ED-related problems. In addition, this module supports the work of the online counselors by alerting them as soon as a participant’s monitoring entries exceed certain cut-offs indicating significant impairment. In each of these cases, the online counselor would then contact the individual participant (see below). This combination of automated and personalized processes allows for inclusion of large samples of participants despite limited personal and professional resources.

Peer and professional support. Similar to the online prevention programs described previously, ProYouth provides online forums that allow participants to interact with each other, discuss various topics, ask questions, and provide support to each other. On a daily basis, moderators (e.g., trained Psychology graduate students) read new postings, reply to questions, and delete inappropriate postings in order to maintain a positive communication atmosphere.
Moderators may also initiate new topics to stimulate discussions among participants.

In addition to the forums, participants can communicate with each other in 60-min chat sessions that are conducted at regular intervals in a group setting led by an online counselor. Participants who wish to talk to a counselor on a one-to-one basis may book an individual 30-min chat session from a list of available appointments in order to discuss more personal questions or concerns. Moderators and counselors may also actively encourage participants to book such sessions if a participant reports severe symptoms in the forum, group chat, or monitoring module. In these cases, the online counselors contact the participants via a personal email explaining the reason why they would get in touch and why they think that it might be beneficial to have a chat meeting. From the counselor’s perspective, a major purpose of the individual chat sessions is to discuss with participants the need for more intense (i.e., face-to-face) support and if necessary encourage them to utilize such support.

**Early intervention and access to regular care.** So far, there is no research in the field of EDs showing that technology-enhanced clinical interventions are as effective as face-to-face specialized treatment (Aardoom et al., 2013; Bauer & Moessner, 2013). Therefore, *ProYouth* counselors recommend that participants engage in regular mental healthcare as soon as they experience substantial symptoms of an ED, such as severe underweight, frequent binge eating, or compensatory behaviors. The online counselors support participants in getting access to expert care by providing information on local or not too distant treatment providers and treatment modalities, and by answering questions and addressing concerns that may prevent participants from seeking face-to-face treatment.
It should be noted that the scientific evaluation of the ProYouth initiative is still underway and conclusions with respect to its potential cannot be drawn at this early stage. Two years after the launch of the online platform, more than 20,000 individuals have accessed the screening tool and over 8,000 have registered for participation in the program. Implementation and dissemination of ProYouth currently include activities via the Internet (e.g., postings to websites, forums), print media (e.g., newspapers, posters, flyers), and social media (e.g., Facebook, Twitter), as well as face-to-face activities involving young people (e.g., workshops in high schools) and stakeholders (e.g. student counseling services, authorities). Ongoing research will allow the research teams in the different European countries to address some of the following research priorities in ED prevention science.

Conclusions and Future Directions

The objectives of this chapter were, first, to review the potential of information and communication technologies for advancing the field of ED prevention and, second, to outline implications for future development and research. Using technology in the context of preventive initiatives makes intuitive sense. The increasing availability of the Internet and mobile devices will continue to expand the reach of such interventions around the globe. The current state-of-the-art indicates that computer-assisted approaches are promising tools that deserve further efforts in both prevention and treatment research. However, there is a limited number of high-quality studies to date and comprehensive research programs are needed in order to provide a sound evidence base concerning the efficacy, effectiveness, cost-effectiveness, and public health impact of technology-enhanced interventions.
Computer-assisted approaches to ED prevention are still a relatively new field and there are many unanswered questions at this stage. In the following, we discuss some of the most urgent topics for future development and research.

**Evaluation of Existing Approaches and Development of New Approaches**

The empirical evaluation of computer-assisted preventive approaches faces challenges on both the conceptual and methodological level. Some of these challenges are equivalent to the challenges inherent to non-computerized preventive approaches; others are specific to technology-enhanced programs. Given that traditional prevention programs that are delivered in face-to-face settings are often unavailable, too complex, and too expensive for general distribution (van Vorhees et al., 2011), many researchers consider the use of information and communication technologies highly promising for the advancement of prevention science.

In the ED field, as in prevention of mental illness in general, there is a need for more systematic and rigorous studies evaluating the efficacy, effectiveness, and cost-effectiveness of such programs. In terms of efficacy, to date only two adequately powered studies have attempted to demonstrate the superiority of an online intervention (compared to a no-intervention control condition) in terms of the prevention of illness onset. Both studies reported mixed findings concerning the overall efficacy of the respective intervention (Lindenberg & Kordy, accepted for publication; Taylor et al., 2006). Most published studies report positive findings with respect to the feasibility and acceptability of computer-assisted approaches, and many report significant effects of such approaches on ED-related risk factors, attitudes, and/or behaviors. However, we would ultimately want to see these interventions reducing the incidence rate of ED and/or reducing the duration of suffering for those who do fall ill. Research is challenged to use such strict outcome criteria in order to convincingly demonstrate the potential of a specific program.
(Chapters 40 & 44). In addition, the investigation of moderators, mediators, response patterns, and mechanisms of change may help to optimize existing computer-assisted approaches and/or may contribute to the development of new interventions.

In the context of computer-assisted approaches this research may be informed by information collected automatically via the software itself. For example, factors such as number of logins, number and type of websites visited, time spent on each page, and exercises or modules completed can be documented easily. This valuable source of information allows us to analyze patterns of use and to determine more or less important components of an intervention. So far, only one study (using the program Student Bodies) has addressed such questions in the field of computer-assisted ED prevention (Manwaring et al., 2008).

Furthermore, compared to traditional prevention programs, technology-enhanced interventions are easier to tailor to specific target groups. Researchers should take more advantage of this fact and tailor prevention programs to the risk profiles of their participants. Furthermore they should consider providing adaptations of programs for subgroups of participants such as males, specific age groups, ethnic minorities, individuals with a migration background, or athletes. The current evidence base on computer-assisted approaches to prevention relies almost exclusively on studies conducted with young women in college or high school settings. Even though this group is at particular risk of developing eating disorders, there is a clear need for research on other target groups and more diverse populations.

In addition to an intervention’s efficacy, it is essential to determine its effectiveness in larger populations and in real-world settings (Becker, Ciao, & Smith, 2008; Marchand, Stice, Rohde, & Becker, 2011; Chapter 44) as is currently being done in the ProYouth initiative. Furthermore, research is needed on the cost and the cost-effectiveness of technology-enhanced approaches. The cost of a computer-
assisted intervention is determined by the initial development of the intervention (e.g., programming, software), the technical infrastructure required (e.g., servers to host the program and to store data), and the cost for maintaining the program over time (e.g., software updates, back-up procedures). In addition, the extent to which a program is automated versus personalized has a major impact on the associated cost. Therefore, it is important to investigate how much involvement of online moderators, online counselors, or clinicians is necessary and to what degree a program may be automated while remaining acceptable and effective (Minarik et al., 2013).

Another important factor with respect to cost is staff time, and especially the requirements for expert staff. Fully automated interventions such as the FMA program described above do not require any direct contact between provider and participant. In contrast, programs including moderated synchronous or asynchronous discussion groups, personal emails to participants, and/or online counseling sessions require a specific amount of staff time. Some staff members need to be skilled in online counseling and all need to have expertise in the field of EDs. In the fixed-intervention approaches, it should be possible to provide quite exact estimates on the amount of staff time and hence the costs associated with delivery of the prevention program per individual participant. An estimation is more complex for more flexible programs such as ProYouth in which participants may display very heterogeneous patterns of utilization, ranging from mere access of automated parts (e.g., the psychoeducation module or the monitoring module) to a very intense utilization of the individual chat module (which is the most costly module of the program). In any case, information on the cost related to the delivery of a prevention program should be assessed and reported as part of future research, because availability of such data is an important pre-condition when discussing the transfer of a program from the
research setting into real-world settings (Minarik et al., 2013). Computer-assisted interventions share the challenges inherent to the research-practice-gap with traditional prevention approaches (Becker, Stice, Shaw, & Woda, 2009).

**Implementation, Dissemination, and Sustainability**

Without any doubt, both the development of innovative technology-enhanced preventive approaches and research into the efficacy, effectiveness, and cost-effectiveness of new and existing approaches are of utmost importance. Yet, they are not sufficient. We also need to conduct studies related to the implementation, dissemination, and sustainability of such approaches in order to identify the most promising models of service delivery. Preventive approaches with a limited reach (due to complexity, required infrastructure, and lack of staff or financial resources) cannot contribute to a significant reduction of the burden of mental illness and may have only a limited public health impact (Muñoz, Beardslee, & Leykin, 2012).

Given the broad and increasing availability of information and communication technologies worldwide, computer-assisted preventive approaches (especially those using Internet via mobile devices) may theoretically be implemented and disseminated broadly and thereby reach huge target populations. However, it is currently unknown how we should optimally address these populations via technology. The fact that a program is publically available on the Internet does not automatically lead to huge numbers of individuals signing up for participation in the program. This is especially the case in prevention when we approach individuals who do not currently suffer from a full-blown ED but show a risk for development of the illness or experience initial symptoms. These individuals might not be aware of their risk and thus might not see a need to engage in an online prevention program. Therefore, as in traditional programs, active promotion of Internet-based preventive programs is required.
But what is the best strategy to do so? Of course, such programs may be promoted in high school, college, or community settings, similar to traditional preventive approaches. However, the reach of such face-to-face strategies is limited and requires substantial resources (e.g., for recruitment and training of facilitators). Other, less expensive options to promote an online program include informing the target population through various print, online, and social media campaigns or strategies. The efficacy of such strategies is largely unknown, as it is currently unclear which portion of a specific target population would take up a program via each of these avenues. Research into questions related to the implementation and dissemination of online preventive interventions is in a very early stage and to our knowledge non-existent in the field of EDs. Clearly, work in this area is needed to guide future efforts related to the implementation and dissemination of computer-assisted preventive approaches.
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ProYouth – ein Online-Programm zur Prävention und frühen Intervention bei Essstörungen

Individualisierte Unterstützung über das Internet


Wie funktionieren internetbasierte Programme?

Im Bereich der Essstörungen wurde in den letzten Jahren eine Vielzahl internetbasierter Programme entwickelt. Sie decken das gesamte Spektrum der Versorgung ab, von der Prävention bis zur Nachsorge und Rückfallprophylaxe (für einen Überblick siehe Aardoom et al. 2013 und Bauer & Moessner 2013).


Im Gegensatz dazu verfolgt das internetbasierte Programm ProYouth einen flexiblen Ansatz, der es den Teilnehmern ermöglicht, die Nutzung des Programms ihren individuellen Vorlieben und Bedürfnissen anzupassen. Den Teilnehmern bleibt es selbst überlassen, welche Komponenten des Programms sie in welchem Ausmaß nutzen. Auch in Bezug auf die Teilnahmedauer gibt es keinerlei Vorgaben.


Was bietet ProYouth?

ProYouth ist ein internetbasiertes Programm zur Prävention und frühen Intervention bei Essstörungen. Das Programm ist eine Weiterentwicklung bereits erprobter Vorgängerversionen (z. B. ES[S]PRIT; Bauer et al., 2009; Appetite4Life; Lindenberg et al., 2011) und frei im Internet verfügbar. Das Programm besteht aus einer Reihe von Modulen unterschiedlicher Intensität.

Module

Selbsttest


- Personen ohne erkennbares Risiko und ohne zumindest subklinische Essstörungssymptome erhalten die Rückmeldung, dass es für sie momentan keinen erkennbaren Bedarf für eine Teilnahme an dem Präventionsprogramm gibt.
- Personen, die schwere Symptome berichten sowie Personen, die bereits eine Behandlung wegen ihrer Essstörungssymptomatik in Anspruch nehmen, wird ebenfalls von einer Teilnahme abgeraten.
- Lediglich bei einem erhöhten Risiko oder dem Vorhandensein von leichten Symptomen wird eine Teilnahme an ProYouth empfohlen.

Unabhängig von den Ergebnissen im Selbsttest und der Empfehlung in der Rückmeldung können sich jedoch alle zur Teilnahme registrieren und haben dann Zugriff auf alle Teile von ProYouth.

Vielfältige Informationen

ProYouth bietet einen umfangreichen Informationsbereich, Notfallkontakte, ein Kontaktformular

Infobox

sowie eine Reihe von Seiten, die über verschiedene Aspekte des Programms informieren (z. B. Das ProYouth Netzwerk, ProYouth in Deutschland, etc.).


- Diese sind bei positivem Zustand sowie Verbesserungen verstärkend formuliert.
- Bei Verschlechterungen werden den Teilnehmern Tipps und Ratschläge zum richtigen Umgang mit Symptomen gegeben bzw. auf weiterführende Hilfsangebote verwiesen oder nahegelegt, sich weiterführende / intensivere / mehr Hilfe zu suchen.


**Newsblog** Im Newsblog werden regelmäßig Nachrichten und Pressemeldungen aus den Bereichen Gesundheit und Essstörungen sowie Hinweise auf interessante Medienbeiträge etc. bereitgestellt. Die Teilnehmer können Kommentare zu den Beiträgen verfassen und diese untereinander diskutieren.

**Chats** An den regelmäßig stattfindenden, von einem Berater geleiteten Gruppenchats können alle Teilnehmer ohne vorherige Anmeldung teilnehmen. Die 60-minütigen Chats finden ca. einmal pro Woche statt, die Teilnehmer können sich auf einem Terminboard über die Termine der nächsten Wochen informieren und den Chatraum zu den angegebenen Zeiten betreten. Zudem haben sie die Möglichkeit, Einzelberatungs-Chats mit einem Berater zu buchen. Die verfügbaren Termine für diese halbstündigen Sitzungen, die von Psychologen angeboten werden, können ebenfalls einem Terminboard entnommen und per Mausklick gebucht werden.

**Compliance bei internetbasierten Interventionen**

Ein Problem von internetbasierten Interventionen sind die oftmals mangelhafte Compliance der Teilnehmer und, damit verbunden, die hohen Drop-out-Raten.


- Bei einer Intervention wie ProYouth, die keine vorgesehene Mindestdosis für die Teilnehmer vorsieht, sondern ihnen die Möglichkeit bietet, das Programm abhängig vom individuellen Bedarf bzw. von individuellen Vorlieben zu nutzen, fällt eine Definition von Drop-out schwer.

Wünschenswert wäre, dass Personen mit einem erhöhten Risiko für die Entwicklung einer Essstörung sowie Personen, die bereits erste Symptome zeigen, längerfristig am Programm teilnehmen. Für Personen ohne erkennbares Risiko wäre eine längerfristige Teilnahme weder indiziert noch erforderlich.

**Bisherige Erfahrungen mit der Nutzung von ProYouth**

**Nutzungsdauer** Während sich eine Hälfte der Teilnehmer nach Selbsttest und Registrierung lediglich einmal loggt, zeichnet sich die andere Hälfte der Teilnehmer durch eine intensive Nutzung und langfristige Teilnahme an der Intervention aus.


Die geringste Wahrscheinlichkeit für eine mehrmaliige Nutzung des Programms zeigen männliche Teilnehmer ohne erhöhtes Risiko, die höchste Wahrscheinlichkeit zeigen Teilnehmer mit einem sehr hohen Risiko (WCS > 82,4), die älter als 21 Jahre sind. Es scheint zu gelingen, dass die Teilnehmer die Intensität der Nutzung des Programms an ihre individuellen Bedürfnisse anpassen.

**Nutzungsverhalten im Teilnahmeverlauf**

Beim ersten Einloggen schauen sich die Teilnehmer zunächst die zentralen Module von ProYouth an und lernen die Seite kennen. Im Laufe ihrer Teilnahme konzentrieren sie sich mehr und mehr auf die interaktiven Komponenten, besonders auf das Forum.

- In knapp der Hälfte aller späteren Sessions suchen die Teilnehmer direkt nach dem Einloggen das Forum auf.
- Die restlichen Module der Plattform spielen bei einer längerfristigen Teilnahme eine untergeordnete Rolle.
Am deutlichsten sind die Unterschiede zwischen der ersten und den darauf folgenden Sessions beim Informationsbereich: Dieser wird beim ersten Besuch der Seite von vielen Teilnehmern besucht, im weiteren Verlauf jedoch nur noch vereinzelt.

Eine Sonderrolle nimmt das Monitoring als zentrales Modul von ProYouth ein: Die registrierten Teilnehmer müssen sich nicht auf der Plattform einloggen, um daran teilzunehmen, sondern sie können direkt über einen temporären Link, den sie wöchentlich per E-Mail erhalten, auf die Befragungen zugreifen. Dieses Angebot wird auch von manchen Teilnehmern in Anspruch genommen, die sich auf der Plattform selbst nicht oder kaum einloggen.


### Diskussion

Die Module verschiedener Intensität ermöglichen eine individualisierte Nutzung des Programms.

- Während knapp die Hälfte der Teilnehmer ProYouth lediglich sporadisch nutzt, nehmen Teilnehmer mit einem höheren Bedarf länger am Programm teil und nutzen auch häufiger die betreuungsintensiveren Module.

- Teilnehmer ohne erhöhte Belastung bzw. erhöhtes Risiko für die Entwicklung einer Essstörung bekommen die Rückmeldung, dass eine Teilnahme für sie nicht indiziert ist. Ein Großteil dieser Teilnehmer nimmt daraufhin auch nicht längerfristig am Programm teil. Die personellen Ressourcen kommen auf diese Weise in erster Linie Teilnehmern mit erhöhtem Bedarf zu.

Bei der frühzeitigen Vermittlung in eine intensivere Behandlung (z.B. Hausarzt, Psychotherapeut) nimmt das Monitoring eine zentrale Rolle ein. Es ermöglicht, besonders problematische Fälle automatisiert zu identifizieren, sodass sie bei der Suche nach Hilfe aktiv unterstützt werden können. Auf diese Weise dient ProYouth nicht nur der Prävention von Essstörungen, sondern darüber hinaus auch der Vermittlung von Teilnehmern in die Regelversorgung.

### Fazit


### Interessenkonflikt

Der korrespondierende Autor gibt an, dass kein Interessenkonflikt besteht.

### Literatur


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