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Help-Seeking Attitudes and Behaviors in Adolescents with Mental Health Problems

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Abstract

Many children and adolescents are affected by mental health problems. At the same time, a significant proportion of these young people do not receive professional help. One reason for this treatment gap is the low help-seeking behavior among adolescents. This is a serious problem, as a lack of professional support as well as delayed treatment onset in this phase of life can lead to chronicity and worsening of mental health issues.

The aim of the present work is therefore to better understand the help-seeking process of adolescents with mental health problems and to improve the utilization of professional support. To this end, a theoretical framework is developed to represent the help-seeking process of adolescents with mental health problems in an integrative socio-cognitive model. In addition, four scientific studies are presented, examining help-seeking attitudes and behaviors and introducing interventions designed to improve help-seeking behavior for adolescents with mental health problems.

Study 1 evaluates an intervention program from the school-based SEYLE study ('Saving and Empowering Young Lives in Europe'), which was designed to promote help-seeking behavior and mental health among adolescents. It was found that only few students took advantage of the support offered, demonstrating no overall effect of the intervention program. However, among those participants who actively used the program, increased utilization of professional support was evident at the 1-year follow-up. **Study 2** presents another school-based project designed to promote help-seeking behavior among adolescents. The ProHEAD study ('Promoting Help-seeking using E-technology for ADolescents') has been implemented in schools across Germany since 2018 and aims to support mental health, prevent the manifestation of mental disorders and to promote help-seeking for mental health problems in adolescents. Following a school-based screening, students in need are invited to an online intervention that offers them individually tailored help in seeking professional support. **Study 3** evaluates preliminary data from the ProHEAD project collected during the first wave of the COVID-19 pandemic in 2020. Compared to a pre-lockdown sample, youth in the first lockdown reported more positive help-seeking attitudes for mental health problems. **Study 4** examines the average time it took youth with suicidal thoughts and behaviors to seek professional support after their mental health problems first emerged. It was found that the average help-seeking delay was 12 to 24 months and that the delay was particularly long for those with a higher symptom burden.

Content

List of scientific publications for the publication-based dissertation

Manuscript 1

Lustig, S., Kaess, M., Schnyder, N., Michel, C., Brunner, R., Tubiana, A., Kahn, J.-P., Sarchiapone, M., Hoven, C. W., Barzilay, S., Apter, A., Balazs, J., Bobes, J., Saiz, P. A., Cozman, D., Cotter, P., Kereszteny, A., Podlogar, T., Postuvan, V., Värnik, A., Resch, F., Carli, V., & Wasserman, D. (under review). The Impact of School-Based Screening on Service Use in Adolescents At-Risk for Mental Health Problems and Risk-Behaviour. *European Child and Adolescent Psychiatry*.

Manuscript 2

Kaess, M., Ritter, S., **Lustig, S.**, Bauer, S., Becker, K., Eschenbeck, H., Moessner, M., Rummel-Kluge, C., Salize, H.-J., Thomasius, R., Resch, F., Koenig, J., & the ProHEAD Consortium (2019). Promoting Help-seeking using E-technology for ADolescents with mental health problems: study protocol for a randomized controlled trial within the ProHEAD Consortium. *Trials, 20*, 94.

Manuscript 3

Lustig, S., Koenig, J., Bauer, S., Moessner, M., Bonnet, S., Becker, K., Diestelkamp, S., Eschenbeck, H., Hiery, A., Kohls, E., Lehner, L., Rummel-Kluge, C., Thomasius, R., Kaess, M., & the ProHEAD Consortium (under review). Impact of COVID-19 related Lock-Down Measures on Help-Seeking Attitudes and Help-Seeking Behavior for Mental Health Problems in Adolescents. *Early Intervention in Psychiatry*.

Manuscript 4

Lustig, S., Koenig, J., Resch, F., & Kaess, M. (2021). Help-seeking duration in adolescents with suicidal behavior and non-suicidal self-injury. *Journal of Psychiatric Research, 223,* 60-67.

Specification of own contribution for publications with multiple authors

Manuscript 1

S. Lustig prepared this publication in collaboration with M. Kaess and N. Schnyder. She contributed essential statistical calculations and wrote the final version of the manuscript. S. Lustig revised the manuscript for important intellectual content in collaboration with all co-authors.

Manuscript 2

S. Lustig wrote the first draft of the study protocol in collaboration with M. Kaess, S. Ritter and J. Koenig. She was critically involved in the realization of the ProHEAD study and participant recruitment. She revised the manuscript for important intellectual content and approved the final version of the manuscript in collaboration with all co-authors.

Manuscript 3

S. Lustig conceived the question of this work, undertook the statistical calculations and wrote the manuscript in collaboration with J. Koenig and M. Kaess. She was critically involved in the realization of the ProHEAD study and participant recruitment. She revised the manuscript for important intellectual content in collaboration with all co-authors.

Manuscript 4

S. Lustig conceived the question of this work, undertook the statistical calculations and wrote the manuscript in collaboration with J. Koenig and M. Kaess. She revised the manuscript for important intellectual content in collaboration with J. Koenig, M. Kaess and F. Resch.

Further publications, which are not the subject of the presented dissertation

Kaess, M., Moessner, M., Koenig, J., **Lustig, S.**, Bonnet, S., Becker, K., Eschenbeck, H., Rummel-Kluge, C., Thomasius, R., Bauer, S., & the ProHEAD Consortium (2020). Editorial Perspective: A plea for the sustained implementation of digital interventions for young people with mental health problems in the light of the COVID-19 pandemic. *Journal of Child Psychology and Psychiatry, 62,* 916-918.

Koenig, J., Kohls, E., Moessner, M., **Lustig, S.**, Bauer, S., Becker, K., Thomasius, R., Eschenbeck, H., Diestelkamp, S., Gillé, V., Hiery, A., Rummel-Kluge, C., Kaess, M., & the ProHEAD Consortium (2021). The Impact of COVID-19 related Lockdown Measures on Self-Reported Psychopathology and Health-Related Quality of Life in German Adolescents. *European Child and Adolescent Psychiatry*, 1-10.

List of figures

1. Introduction

A worrying number of young people are dealing with mental health problems. In this phase of life, neuropsychiatric disorders are the most common causes of disability (Gore et al., 2011). The life time prevalence rate for mental disorders, for those between 13 and 18 years of age, is estimated at about 50%. The most frequent mental disorders at this age are anxiety disorders and behavior disorders, but mood disorders and substance use disorders are also common among adolescents (Merikangas et al., 2010). Mental illnesses in adolescence need immediate and adequate care, as the failure to treat adolescents with mental health problems has particularly long-term consequences. About 75% of young adults affected by a psychiatric disorder were diagnosed before 18 years of age, emphasizing the high risk of chronification and long-term impairment associated with mental health problems in adolescence (Kim-Cohen et al., 2003). In addition, many adolescents are affected by suicidal behavior and non-suicidal self-injury, which is closely associated with increased risk for suicide (Evans, Hawton, Rodham, & Deeks, 2005; Groschwitz et al., 2015). In fact, suicide is one of the leading causes of death for young people in Europe (Steele & Doey, 2007).

However, despite the high need, utilization of conventional care in this age group is low. Only one quarter to one third of adolescents with mental health problems receive professional care (Merikangas et al., 2011; Sanci, Lewis, & Patton, 2010). Thus, a large proportion of young people with mental health problems do not seek professional help despite an existing need. The reasons for adolescents' poor help-seeking behavior have been discussed extensively in scientific research, and as a result, many potential barriers and facilitators to professional help have been identified in recent decades (Gulliver, Griffiths, & Christensen, 2010). It has been shown, for example, that a lack of information about mental illness and the treatment process, or the existing stigma around mental illness can prevent adolescents from seeking professional help. On the other hand, more positive attitudes toward help-seeking, or some demographic variables such as female gender are associated with improved use of professional help services (Gulliver et al., 2010; Hom, Stanley, & Joiner, 2015; Rickwood, Deane, Wilson, & Ciarrochi, 2005).

Based on these findings, a number of efforts have been made to improve help-seeking behavior among people with mental health problems. However, many do not address the specific needs of adolescents but instead target young adults (e.g., Gulliver et al., 2012; Taylor-Rodgers & Batterham, 2014), others suffer from small sample sizes or lack of a control group (Kauer, Mangan, & Sanci, 2014). Moreover, most interventions to improve help-seeking behavior lack embeddedness in a comprehensive theoretical model.

This dissertation presents two large-scale studies using randomized controlled trials (RCTs) to support adolescent mental health. In both projects, school-based screenings are used to identify adolescents with mental health problems, who are then offered professional support in a variety of ways. In addition, the help-seeking process of adolescents is examined in more detail by investigating the duration from the onset of symptoms to seeking professional help. To embed these findings in a theoretical framework, a theoretical model of the help-seeking process among adolescents with mental health problems is developed and applied to the study findings. Through this research, the present work aims to better understand the help-seeking process of adolescents with mental health problems, to identify and address entry points for improving utilization to close the treatment gap, and to ultimately improve adolescent mental health.

2. Understanding help-seeking for mental health problems among adolescents against the background of a theoretical framework

A broad definition of help-seeking could be 'actively seeking help from other people' (Rickwood et al., 2005, p. 4). Help-seeking is thus a basic social process that can take place in almost every area of everyday life. At the same time, the substantial treatment gap for mental disorders shows that seeking professional help can be a difficult step to take (Kohn, Saxena, Levav, & Saraceno, 2004). To better understand what makes this step so difficult, it is useful to embed the different factors influencing help-seeking behavior in a theoretical framework.

To date, some attempts have been made to theoretically underpin the help-seeking process for mental health problems. One model that has been applied in recent years to help-seeking for mental health problems is the Health Belief Model (Rosenstock, 1974, 1990). The Health Belief Model (HBM) provides a socio-cognitive approach to explaining why some people perform health behaviors and others do not. According to the HBM, whether a health behavior is carried out depends on the conviction of how dangerous the illness is (*perceived vulnerability* and *perceived severity*) and on beliefs regarding how effective a treatment is (*perceived benefits* and *perceived barriers)*. According to the model, these beliefs are influenced by individual *demographic variables* and *psychological characteristics*. In addition, it is assumed that external *cues to action* can influence health behavior. The model has long been applied primarily to health behaviors in the somatic domain (Janz & Becker, 1984; Khosravizadeh, Ahadinezhad, Maleki, Vosoughi, & Najafpour, 2021; Lau, Lim, Jianlin Wong, & Tan, 2020), but in recent years has been applied to mental health as well (Henshaw & Freedman-Doan, 2009). Isolated studies have successfully used the model to better understand help-seeking behavior for mental health problems (Kim & Zane, 2016; O'Connor, Martin, Weeks, & Ong, 2014). These approaches demonstrated that the HBM is well suited for sorting out the factors that influence the help-seeking process and for finding starting points to improve help-seeking behavior. Although several influencing factors were missing in previous approaches, the HBM allows for a much more nuanced understanding of the help-seeking process than previous research, which often lacked a theoretical basis.

Until now, a distinction has often been made between 'barriers' that prevent people from seeking help and 'facilitators' that facilitate the help-seeking process (see for example Gulliver et al., 2010; Hom, Stanley, & Joiner, 2015; Rickwood et al., 2005). Although this division into barriers to be reduced and facilitators to be promoted is generally a practical approach, it falls short. This categorization groups together very different influencing factors that actually belong to fundamentally different processes. The HBM enables a differentiated view of the help-

seeking process by separately considering the impact of beliefs in health threats (in turn composed of *perceived susceptibility* and *perceived severity*), beliefs in treatment effects (composed of *perceived benefits* and *perceived barriers*), and *self-efficacy*. This more nuanced approach not only does better justice to the complex issue of help-seeking, but also provides concrete starting points to improve help-seeking behavior.

In addition, previous research has tended to refer to 'help-seeking attitudes' in general terms, but it remains rather unclear what these attitudes include and how they are formed. Here, too, the HBM offers a good approach for a deeper understanding, since help-seeking attitudes can be understood as a product of the five main factors, which in turn are influenced by demographic and psychological variables. Further, in previous research the distinction between help-seeking attitudes, help-seeking intentions and actual help-seeking behavior was often not clear enough. In some cases, studies stopped at evaluating help-seeking attitudes or intentions without ever capturing actual behavior (Kim & Zane, 2016; O'Connor et al., 2014). Although positive attitudes toward professional support or even the intention to seek help do not necessarily lead to actual help-seeking behavior, there is clear evidence that help-seeking attitudes can predict intentions to seek help to some degree, and that help-seeking intentions in turn are associated with actual help-seeking behavior (Mackenzie, Gekoski, & Knox, 2006; Sutton, 1998; Vogel & Wester, 2003).

The differentiation between attitudes, intentions and behavior as well as the close relationship between the separate constructs cannot be clearly represented in the conventional HBM. At this point, an integration of the Theory of Planned Behavior (TPB; Ajzen, 1985) is appropriate. The TPB explains behavior as a consequence of intentions. According to the TPB, intentions are shaped by various constructs, some of which are also included in the HBM (e.g., control beliefs and perceived behavioral control in the TPB are similar to self-efficacy in the HBM). Therefore, for a comprehensive theoretical framework of the help-seeking process, the present dissertation proposes an integration of the TPB into the HBM, resulting in an integrative socio-cognitive model of the help-seeking process for mental health problems (Figure 1). This model provides a better understanding of the complex interrelationships and clarifies which processes can be addressed in order to improve help-seeking attitudes, help-seeking intentions, and ultimately help-seeking behavior.

In the following chapters, this integrative model will be used to describe and structure the current state of research on the help-seeking process of adolescents with mental health problems.

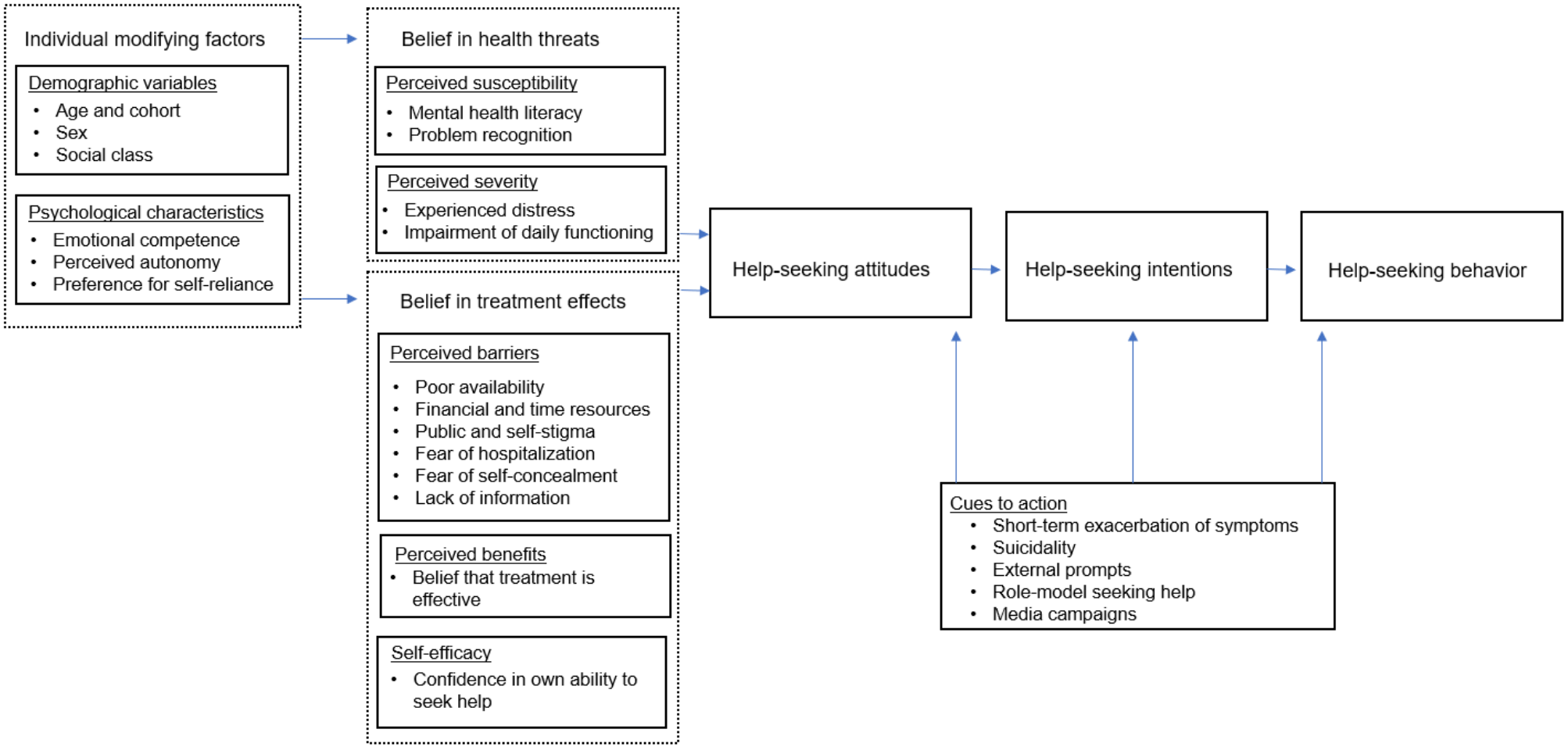

Figure 1. Integrative socio-cognitive model of the help-seeking process for mental health problems.

2.1 Belief in treatment effects: Perceived barriers, perceived benefits and self-efficacy

A major factor influencing adolescent help-seeking behavior are the *perceived barriers* to getting help. These include structural factors such as poor availability of professional help services especially in rural areas, or a lack of financial or time resources (Gulliver et al., 2010). Unexpected events like the coronavirus disease 2019 (COVID-19) pandemic with its associated physical distancing requirements can be understood as additional barriers to healthcare services such as psychotherapy or outpatient psychiatric treatments. In addition to these structural barriers, some psychological barriers can inhibit help-seeking behavior. The most discussed barrier to professional mental health care is the stigma associated with mental illness and psychotherapy. Both perceived public stigma (i.e. concerns about what others might think about one's mental illness or seeking help) and especially self-stigma (i.e. own stigmatizing attitudes about mental illness) have been found to place a significant barrier to professional mental healthcare (Clement et al., 2015; Schnyder, Panczak, Groth, & Schultze-Lutter, 2017). Further individual barriers include concerns about the confidentiality of mental health services, fear of hospitalization, fear of self-concealment in therapy, and a lack of information about where and how to find appropriate support (Gulliver et al., 2010; Hom et al., 2015; Komiya, Good, & Sherrod, 2000). All of these barriers can prevent adults and youth alike from seeking help, however, many of these perceived barriers represent a particularly large hurdle for young people. This relates to structural barriers such as distance to support services, but also to psychological barriers, especially stigma, since the fear of being excluded from the peer group poses a particular threat to young people (Rickwood et al., 2005).

While the *perceived barriers* help to understand what might keep adolescents from seeking help, investigating the *perceived benefits* reveals possible reinforcers of help-seeking behavior. Perceived benefits in this context primarily mean the extent to which professional care for mental illness is perceived as helpful and effective. Young people who believe that therapy will help them are more likely to seek such help (Rickwood et al., 2005; Wilson & Deane, 2001).

The revised HBM (Rosenstock, Strecher, & Becker, 1988) further includes *self-efficacy* as a factor influencing health behaviors. With regard to help-seeking, this means that a higher confidence in one's own ability to seek professional help increases the use of professional help services. Supporting this assumption, positive past experiences with psychotherapy, equivalent to a mastery experience as an essential source of self-efficacy (Bandura, 1997), have been widely confirmed as one of the most effective facilitators for future help-seeking behavior (Hom et al., 2015; Rickwood et al., 2005) .

2.2 Belief in health threats: Perceived susceptibility and perceived severity

According to the HBM, the perceived threat of an illness impacts decisions to perform a health behavior. The perceived threat is partially explained by the personal conviction of how vulnerable one personally is to the disease in question, i.e. the *perceived susceptibility* (Rosenstock, 1974). In terms of help-seeking behavior, perceived susceptibility is closely associated to mental health literacy and problem recognition capabilities. A basic knowledge of mental illness and the ability to recognize symptoms of psychological distress can be assumed as a prerequisite to feel vulnerable to a mental health related problem (Kim & Zane, 2016). In fact, difficulties in identifying the symptoms of mental illness have been shown to inhibit adolescent help-seeking (Gulliver et al., 2010). Many young people are told that mood swings or depressive moods are normal during puberty, so that if they lack mental health literacy they do not always realize at what point professional help would be appropriate. However, higher problem recognition and thus increased *perceived susceptibility* do not necessarily lead to increased use of professional support. Under certain circumstances, for example when perceived benefits are low, high perceived susceptibility may actually reduce help-seeking intentions (O'Connor et al., 2014). One possible explanation could be that individuals who feel very vulnerable perceive disclosure of their own emotional state as a risk they would prefer to avoid if no significant benefits are expected from seeking help.

A similar mechanism can be observed for the second component of perceived threat, *perceived severity*. In general, it is observed that adolescents who are more severely affected by a mental illness, i.e. who experience greater distress and impairment, are more likely to seek help (Hom et al., 2015; Thompson, Hunt, & Issakidis, 2004; Wang, Berglund, & Kessler, 2000). On the other hand, it has been shown that in adolescents with severe suicidal ideation, hence when the *perceived severity* is particularly high, the so-called help-negation effect occurs. This means that those who are most severely affected and would most urgently need professional help do not take advantage of it, possibly because hopelessness prevails in this situation (Hom et al., 2015).

These findings show that *perceived susceptibility* and *perceived severity* are key targets for improving adolescents' help-seeking behavior, but they also highlight the complexity of the interrelationships between the individual influencing factors.

2.3 Demographic variables and psychological characteristics

In the context of the HBM, perceived health threats and perceived treatment effects are assumed to be influenced by several demographic variables and individual psychological characteristics. Scientific studies have already examined and identified many of these possible

influencing factors regarding adolescent help-seeking. For example, older age at onset, being in a younger cohort, female gender, and higher social class seem to positively influence the help-seeking process for mental health problems (Rickwood et al., 2005; Rowe et al., 2014; Wang et al., 2005). One psychological variable that influences the help-seeking process is emotional competence, with higher levels associated with more successful help-seeking (Rickwood et al., 2005). Further, preference for self-reliance and higher perceived autonomy are psychological characteristics associated with diminished help-seeking (Gulliver et al., 2010; Hom et al., 2015; Pumpa & Martin, 2015). This connection is particularly relevant for adolescents who are at an age when they are breaking away from their parents and becoming increasingly independent (Rickwood et al., 2005).

In light of the integrative socio-cognitive model of help-seeking, these effects should be understood less as direct influences on behavior and more as predictors of *perceived health threats* and *perceived treatment effects*, that is, as indirect antecedents of *help-seeking attitudes*. For example, females are more likely to attribute physical pain emotionally than males, which would increase the *perceived susceptibility* to mental illness and ultimately help-seeking behavior (Henshaw & Freedman-Doan, 2009). Thus, embedding the demographic variables and psychological characteristics into a theoretical model here allows for a deeper understanding of the underlying processes.

2.4 Help-seeking attitudes, help-seeking intentions, cues to action and actual help-seeking behavior

Help-seeking attitudes are an important starting point for promoting help-seeking behavior, as they influence help-seeking intentions, which in turn are directly related to behavior (Mackenzie et al., 2006; Sutton, 1998; Vogel & Wester, 2003). In current research, help-seeking attitudes usually refer to various individual attitudes that are broadly related to mental illness and the help-seeking process. These include, for example, whether one considers mental illness to be something shameful, whether one believes that therapy could help, or whether one thinks that it is a sign of strength to cope with emotional problems on one's own (Mackenzie, Knox, Gekoski, & Macaulay, 2004). Thus, there is an intermingling of attitudes that are formed from processes that can actually be differentiated. The proposed integrative socio-cognitive framework therefore interprets help-seeking attitudes as a combination of treatment beliefs and perceived health threats, which in turn are influenced by psychological characteristics and demographic variables. In fact, more positive help-seeking attitudes have been shown to be associated with a variety of these individual characteristics, e.g. female gender, younger age, or social class (ten Have et al., 2009).

The intentions to seek help for a mental health problem, i.e. the *help-seeking intentions,* become higher with a more positive attitude, but they only become relevant when there is actually a problem and also a corresponding awareness of the problem (Mackenzie et al., 2006). The strength of an intention is often related to the actual behavior, but not in every case (Rickwood et al., 2005). For example, external reasons such as long waiting lists for psychotherapy may prevent help-seeking behavior even if the intention is present.

On the other hand, *cues to action* can very quickly lead to active help-seeking behavior without fundamental health beliefs being changed. A common cue to action among youth are parents, who provide the impetus for professional help-seeking, but such external prompts can also come from general practitioners, teachers, or youth workers (Rickwood et al., 2005). Other conceivable cues to action would be a sudden worsening of symptoms or that people from the peer group seek help for themselves and thus act as positive role models. Within the framework of the integrative socio-cognitive model of the help-seeking process, it is assumed that these cues to do not necessarily influence behavior in a direct way. In some cases, they may initially lead to a change in attitudes toward help-seeking. In other cases, a cue to action, e.g. a short-term exacerbation of symptoms, may lead directly to a help-seeking intention, which in turn may be prevented from being translated into action if external reasons intervene.

The term *help-seeking behavior* seems unambiguous at first, but in the context of mental health problems it is a concept that is often defined and captured in different ways and thus can encompass very different behaviors (Rickwood & Thomas, 2012). A distinction is often made between formal and informal help-seeking behavior (Rickwood et al., 2005). Informal help-seeking behavior includes asking for help from friends or family, whereas formal help-seeking means seeking support from professional sources, such as psychiatrists or psychotherapists. Informal points of contact are very valuable resources for supporting mental health, as the barriers to using it are low and young people in particular prefer to talk about their mental health problems with friends or family (Boldero & Fallon, 1995; Rickwood, Deane, & Wilson, 2007). However, when it comes to clinically relevant mental disorders, professional help is necessary, which is why the present work refers to seeking out professional contact points.

Another factor to consider when looking at *help-seeking behavior* is the question of help-seeking duration. After all, even those who do seek help for mental health problems often wait a long time to do so (Wang et al., 2007). This delay in the help-seeking process is problematic because it creates a risk of chronicity, especially in adolescence, and because untreated mental illness has been associated with increased symptom severity and lethality (Melle et al., 2008; Nery-Fernandes et al., 2012). Nevertheless, to date, there is little robust data on the

average length of help-seeking delays among adolescents and on factors that may influence the duration. Meaningful data are available only for young people with psychosis (Bechard-Evans et al., 2007; Dominguez et al., 2013).

All in all, this overview of help-seeking attitudes, intentions and behaviors illustrates why a differentiated theoretical framework is necessary. In the following chapters, this and other shortcomings of previous research are summarized, followed by a presentation of the contributions of this work to improve the state of research.

3. Problems in current research

In general, there is a relatively large amount of research on help-seeking behavior among adolescents. The high incidence of mental illness among adolescents and the low utilization of professional help in this age group are well known problems, which have already led to various empirical studies and also some systematic reviews (Gulliver et al., 2010; Rickwood et al., 2005; Rowe et al., 2014; Zwaanswijk, Verhaak, Bensing, van der Ende, & Verhulst, 2003). Nevertheless, there are several problems in the research to date that reduce the effectiveness of efforts to close the treatment gap for youth with mental health problems.

First, in most cases, the research is not embedded in a theoretical model. There are some approaches to applying psychological theories to help-seeking behavior (e.g. the Theory of Planned Behavior; Mak & Davis, 2014; Mesidor & Sly, 2014, and the Health Belief Model; Kim & Zane, 2016; O'Connor et al., 2014) or to establishing specific models of help-seeking (Pescosolido & Boyer, 1999). However, none of these approaches is comprehensive enough to do justice to the complex issue of seeking help for mental health problems. Still, a theoretical framework is essential to better understand the psychological and social processes involved in help-seeking. Only in this way will it be possible to understand where help-seeking processes can fail and thus find very concrete and individually tailored starting points to facilitate the process and enable successful help-seeking.

Another problem in current research on this topic, which is partly related to the lack of a theoretical framework, is that there is not enough distinction between the different constructs that seem to be related to the help-seeking process. As described in section 2, this applies not only to an undifferentiated view of help-seeking 'barriers' and 'facilitators', but also to an insufficient separation between help-seeking attitudes, intentions and behavior. In addition, the concept of 'help-seeking behavior' is unclear, which is then also reflected in very different measurement approaches depending on the study (Rickwood & Thomas, 2012). This is not only a theoretical problem; even in studies that present very practical interventions to improve help-seeking, the distinction is not always clear (Cusimano & Sameem, 2011; Hom et al.,

2015). An illustrative example of the lack of differentiation is a study by O'Connor and colleagues in which the title explicitly states to examine 'factors that influence young people's mental health help-seeking behavior' (2014), but the outcome variable is only a self-report questionnaire about help-seeking intentions.

Further, there are very few interventions that are geared to the special needs of adolescents. Young people are just learning to solve problems on their own, making independence and self-reliance important developmental goals. In addition, the peer group is more important for young people, which makes the issue of stigma as a barrier to professional help even more relevant. There is also a generation effect - today's young people have grown up with the Internet, they are familiar with it and feel safe there. Accordingly, the Internet plays a greater role in healthcare for today's young people than it does for older generations, a fact that is often not sufficiently taken into account (Park & Kwon, 2018). Seeking help for mental health problems is therefore a different challenge for adolescents than it is for adults - not least because rapid and appropriate support for mental health problems is particularly important at this age.

One topic on which there is still very little data in the youth field is the topic of help-seeking duration, i.e. how long it takes from the onset of the first symptoms until professional help is sought. Although it is well established that delay in the help-seeking process exacerbates symptoms of psychological distress and is even associated with increased mortality, the topic has been well researched only for adults (Melle et al., 2008; Nery-Fernandes et al., 2012). For adults, help-seeking delays are reported to average 7 to11 years, a substantial length of time with untreated symptoms (Olfson, Kessler, Berglund, & Lin, 1998; Wang et al., 2007; Wang, Berglund, Olfson, & Kessler, 2004). This issue has been poorly illuminated for adolescents and urgently needs more attention to figure out how to shorten the help-seeking duration to ensure rapid and adequate care for young people in need.

Overall, despite numerous studies on possible barriers and facilitators of adolescent help-seeking, there is currently a lack of a comprehensive theoretical model that identifies strategies for action. In addition, there is an urgent need for new approaches to improve help-seeking that address the specific needs of children and adolescents of the current generation.

4. Contributions of the present work

As described above, previous research lacks a comprehensive theoretical model that accounts for all relevant variables. There is also a lack of evidence-based and effective approaches to improve help-seeking behavior among adolescents. The present work attempts to fill this gap by presenting and evaluating concrete measures to improve help-seeking behavior among children and adolescents based on large-scale scientific studies. In addition, the existential and so far, understudied topic of help-seeking duration among adolescents with mental health problems is examined in more detail. By embedding them in the integrative socio-cognitive model of the help-seeking process for mental health problems presented in section 2, these results, as well as previous research, are given a comprehensive theoretical framework.

In the four manuscripts presented below, various variables of the model are targeted, and the relevant constructs of the model are illustrated in bold in the figure for each case. The first three manuscripts address interventions specifically designed to improve help-seeking behavior among youth with mental health problems. The first study presents results from the school-based SEYLE study (‘Saving and Empowering Young Lives in Europe') which was conducted from 2009 to 2011 in 11 European countries and focused on suicide prevention among young people. Manuscript 2 and 3 report results from the ongoing ProHEAD study (‘Promoting Help-seeking using E-technology for ADolescents’), which has been conducted in numerous schools across Germany since 2018 and is designed to target adolescents' help-seeking behavior in addition to general and indicated prevention. Finally, the fourth manuscript examines the important issue of help-seeking duration, for which little robust data have been available to date in the area of adolescents.

4.1 Manuscript 1: The Impact of School-Based Screening on Service Use in Adolescents At-Risk for Mental Health Problems and Risk-Behaviour

Lustig, S., Kaess, M., Schnyder, N., Michel, C., Brunner, R., Tubiana, A., Kahn, J.-P., Sarchiapone, M., Hoven, C. W., Barzilay, S., Apter, A., Balazs, J., Bobes, J., Saiz, P. A., Cozman, D., Cotter, P., Kereszteny, A., Podlogar, T., Postuvan, V., Värnik, A., Resch, F., Carli, V., & Wasserman, D. (under review). The Impact of School-Based Screening on Service Use in Adolescents At-Risk for Mental Health Problems and Risk-Behaviour. *European Child and Adolescent Psychiatry.*

One way to improve help-seeking behavior among adolescents with mental health problems is through school-based screenings. The advantage of this method is that a large number of adolescents can be reached in an uncomplicated way, regardless of whether they perceive a burden in themselves and regardless of whether they would seek help for this at the moment (Dowdy, Ritchey, & Kamphaus, 2010; Robinson et al., 2013; Scott et al., 2009). School-based projects are thus well suited for the prevention of mental illness, but also for identifying young people who are already under stress and offering them targeted help.

One such school-based project was the SEYLE study (Wasserman et al., 2010). SEYLE was an RCT targeting prevention and early intervention for mental health problems and risk behaviors in adolescents. The study included three school-based interventions aimed specifically at suicide prevention, and a control group. A total of *N* = 12,395 students from 11 European countries participated in one of the interventions and in a comprehensive accompanying questionnaire survey. One of the school-based programs was called ‘Screening by Professionals’ (ProfScreen), in which participants were invited to an interview with a psychologist or psychiatrist if they indicated a relevant level of distress in the screening. If the interview revealed that a student needed professional help for their mental health problems, they were referred to appropriate services.

The purpose of the present study was to examine whether the ProfScreen program could improve participants' help-seeking behavior and whether it had an impact on mental health status one year later. The evaluation of the one-year follow-up of *N* = 4,172 participants of the ProfScreen intervention showed that the use of professional support was very low, even among adolescents who were identified as troubled at screening. Only 3.6% of participants identified as being ‘at-risk’ for mental health problems or risk behaviors had actually sought help one year after screening. This low rate could not be lifted by the ProfScreen program per se, as the uptake of the program itself was also low. Only 40.7% of adolescents who were offered a consultation with a psychologist or psychiatrist took advantage of it. With reference to the integrative socio-cognitive model of the help-seeking process this finding highlights the importance of *perceived barriers* to seeking help for mental health problems. Not only should

the barriers to professional contact points be low, but it is equally important that participation in help-seeking interventions is as low-threshold as possible. Other results from the SEYLE study have shown that the participation rate in the interview with a mental health professional was increased when there was a shorter waiting time for the interview and when the interview took place at school (Kaess et al., 2014).

Among those participants who attended the ProfScreen interview and received a recommendation for further professional support, the 1-year follow-up then actually showed an increased use of professional help (OR = 2.747, 95% CI = 1.457 - 5.181). In the context of the integrative socio-cognitive model, the positive effect of the ProfScreen intervention on help-seeking behavior can be understood as a strengthening of *perceived susceptibility*: the interview with a mental health professional can be seen as an educational conversation promoting the participant's mental health literacy. Further, the feedback from a psychologist or psychiatrist that there are serious warning signs of mental stress and the recommendation to seek further professional support can be interpreted as a reinforcement of problem recognition.

Thus, help-seeking behavior could be improved through active participation in ProfScreen. However, the effect of the ProfScreen intervention on mental health status one year after baseline could not be clearly determined due to differences in data quality between participants from different countries. Nevertheless, the results of this study clearly indicate an important starting point for improving health care for adolescents with mental health problems: School-based interventions can improve help-seeking behavior among these youth, but only if they are used.

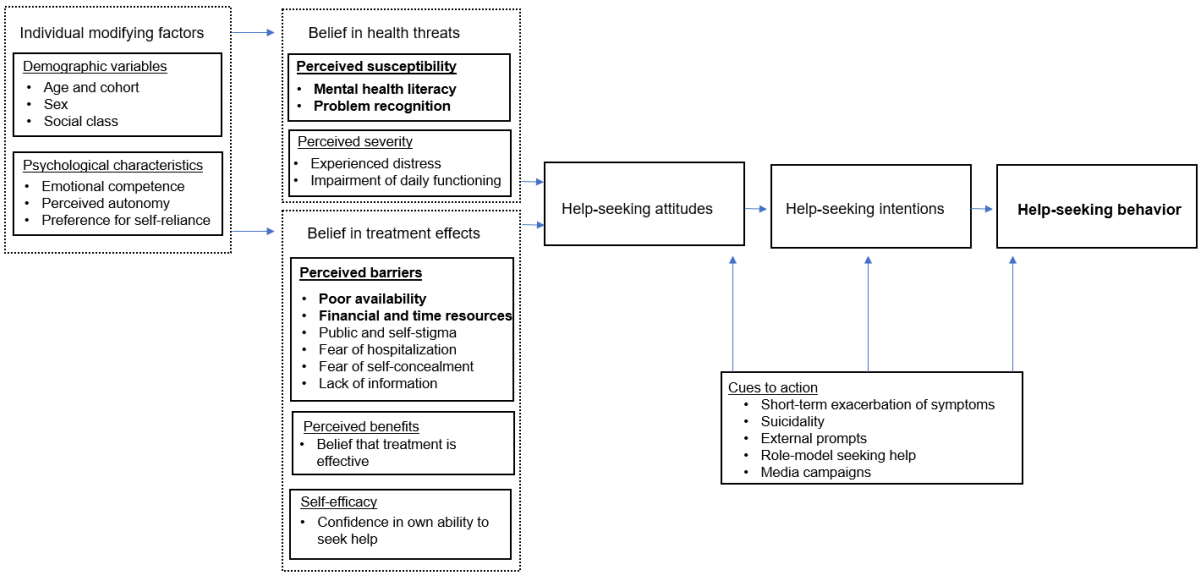

Figure 2. Integrative socio-cognitive model of the help-seeking process for mental health problems applied to manuscript 1.

4.2 Manuscript 2: Promoting Help-seeking using E-technology for ADolescents with mental health problems: study protocol for a randomized controlled trial within the ProHEAD Consortium

Kaess, M., Ritter, S., Lustig, S., Bauer, S., Becker, K., Eschenbeck, H., Moessner, M., Rummel-Kluge, C., Salize, H.-J., Thomasius, R., Resch, F., Koenig, J., & the ProHEAD Consortium (2019). Promoting Help-seeking using E-technology for ADolescents with mental health problems: study protocol for a randomized controlled trial within the ProHEAD Consortium. *Trials, 20*, 94.

As the findings from the SEYLE study show, school-based projects can be helpful in reaching youth in need if barriers to participation are kept low. A good way to help young people participate in health promotion interventions is through the Internet. Many young people search the Internet for health-related information anyway (Park & Kwon, 2018; Younes, Chollet, Menard, & Melchior, 2015). However, this information is often unfiltered, not processed in an age-appropriate way, or even plain wrong. Professional Internet-based mental health information and intervention services therefore have great potential to reach adolescents and provide them with correct information and safe interventions. Besides low-threshold access und reduced stigma, advantages of Internet-based mental health services include an enhanced reach, low cost, time efficiency and interactive components (Kauer et al., 2014).

This study protocol presents an RCT aiming to promote adolescent help-seeking from the ongoing school-based ProHEAD study. ProHEAD is a large-scale study implemented at six study sites across Germany with the coordinating study site located in Heidelberg. Comprising five sub-projects designed as five separate RCTs, ProHEAD aims to support mental health, prevent the manifestation of mental disorders and to promote help-seeking for mental health problems in children and adolescents via E-technology. Students from age 12 are invited to take part in a school-based screening for mental health problems and health-risk behaviors. Based on the screening, students are identified as either currently ‘healthy’, ‘high-risk’, or having ‘mental health problems’, and are subsequently invited to an online-intervention matching their individual needs.

The intervention presented in this study is offered to adolescents who scored above certain cut-offs on the school-based survey and who, accordingly, appear to have mental health problems in need of treatment. Participants are randomly assigned to the intervention or control group. They receive the invitation to the intervention by mail after completing the school-based survey. An activation link takes them to an Internet portal that contains different modules depending on the group. In both groups, participants receive individual feedback on their answers in the survey, together with advice to seek professional help. Both groups are

provided with a list of contact points (psychiatrists, psychologists, counseling centers, psychiatric clinics) in their vicinity.

The intervention group is also given access to further modules designed to support the help-seeking process. In an information module, participants can read age-appropriate texts on mental illness and watch videos of young people who are or have been affected by mental illness and have successfully sought help. Also, part of the intervention is a communication module through which participants can communicate with professional counselors via messages, chats, and phone calls. Trained case managers in this framework accompany the adolescents on their way to professional face-to-face contact points in one-to-one support. Further, as part of an automated monitoring system, young people are regularly asked whether they have already sought help, and if not, what barriers currently prevent them from doing so. One year after the school-based screening, another survey is conducted in the classroom to assess the effects of the intervention compared to the control group.

With this concept, the ProHEAD intervention addresses numerous factors that, according to the integrative social-cognitive model of the help-seeking process, can promote help-seeking behavior. On the one hand, *perceived barriers* are reduced, as online access ensures anonymity and avoids stigmatization, while potential further barriers such as distance, time and cost are completely bypassed. Psychoeducational texts and videos also include information on successful treatment options that can reinforce the *perceived benefits.* Seeing other teens in the videos provided who have successfully sought help can reinforce *self-efficacy* in the sense of vicarious experience. In addition, *perceived susceptibility* is addressed by increasing problem recognition via feedback on problem areas and by strengthening mental health literacy through psychoeducation. The automated monitoring module provides feedback on what individual barriers exist (e.g., fear of hospitalization or fear of cost) in a resource-saving manner so that they can be directly addressed and overcome. In addition, the personal support provided by professional consultants enables a very individual view of the current situation, so that the relevant issues can be addressed precisely, whether it is a matter of reducing *perceived barriers*, strengthening *perceived susceptibility*, promoting *perceived benefits* or strengthening *self-efficacy.* In some cases, ProHEAD can also trigger a *cue to action,* e.g. when acute suicidality is expressed to the professional counselor and police are called as part of the emergency procedure.

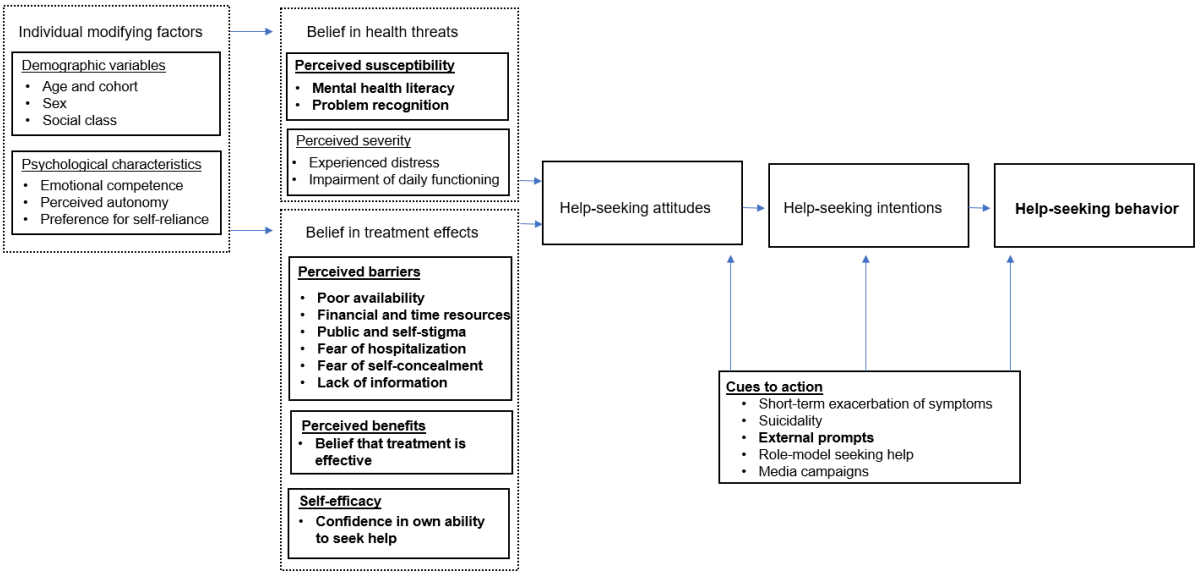

Figure 3. Integrative socio-cognitive model of the help-seeking process for mental health problems applied to manuscript 2.

4.3 Manuscript 3: Impact of COVID-19 related Lock-Down Measures on Help-Seeking Attitudes and Help-Seeking Behavior for Mental Health Problems in Adolescents

Lustig, S., Koenig, J., Bauer, S., Moessner, M., Bonnet, S., Becker, K., Diestelkamp, S., Eschenbeck, H., Hiery, A., Kohls, E., Lehner, L., Rummel-Kluge, C., Thomasius, R., Kaess, M., & the ProHEAD Consortium (under review). Impact of COVID-19 related Lock-Down Measures on Help-Seeking Attitudes and Help-Seeking Behavior for Mental Health Problems in Adolescents. *Early Intervention in Psychiatry.*

Through its online access, the ProHEAD project offers a particularly low-threshold service for young people with mental health problems who need support in finding professional help. This approach became even more important when the COVID-19 pandemic led to school closures across Germany in March 2020. This completely changed the daily life of pupils all over Germany, in addition to general containment efforts and physical distancing rules. Accordingly, the first wave of the Corona pandemic has posed significant mental health challenges for many children and adolescents (Racine et al., 2020). The present study takes advantage of the unique opportunity provided by the already implemented ProHEAD study to compare data from adolescents before and during the lockdown and thus gain insight into the adolescent help-seeking process during the pandemic.

Typically, in the ProHEAD study, baseline surveys are conducted online but on-site in school computer labs. This approach was no longer possible due to contact restrictions as of March 16th 2020. Short-term adjustments in the recruitment process allowed participating students to complete the surveys from home during the summer of 2020 as part of the homeschooling process. In this way, 324 adolescents of a 'post-lockdown sample' could be surveyed on psychological wellbeing, help-seeking attitudes and help-seeking behavior between March 16th and August 31st 2020. Comparing the post-lockdown sample with a pre-lockdown sample matched for age, gender, and school type (N = 648), it was found that adolescents from the post-lockdown sample reported more positive help-seeking attitudes ($t_{(648)} = 2.87$, $p = .004$, $d = .224$). However, there were no differences in help-seeking behavior or psychological well-being. For participants who were not interviewed until the end of the survey period in August 2020, help-seeking attitudes had returned to pre-lockdown levels.

It is possible that the more positive attitudes in the post-lockdown sample are related to the fact that, especially at the beginning of the COVID-19 pandemic, there was a lot of public talk about the possible consequences of the contact restrictions on mental health (e.g. Harvard Pilgrim Health Care, 2020; International Red Cross and Red Crescent Movement, 2020; World Health Organization, 2020). Although no causal relationships can be demonstrated in this cross-sectional study, it is conceivable that the temporary increase in public discourse reduced stigmatizing attitudes. Nevertheless, the more positive attitudes in this sample did not translate into more help-seeking behavior, which can be well explained by the continued difficulty in accessing health care services within the pandemic.

In terms of the integrative social-cognitive model, this study primarily illustrates the effects of external events as *cues to action* on the help-seeking process. The COVID-19 pandemic and the accompanying news coverage may have had an effect on *help-seeking attitudes*. At the same time, the findings show once again that *help-seeking attitudes* do not always lead to *help-seeking behavior* and how relevant it is to clearly separate these constructs.

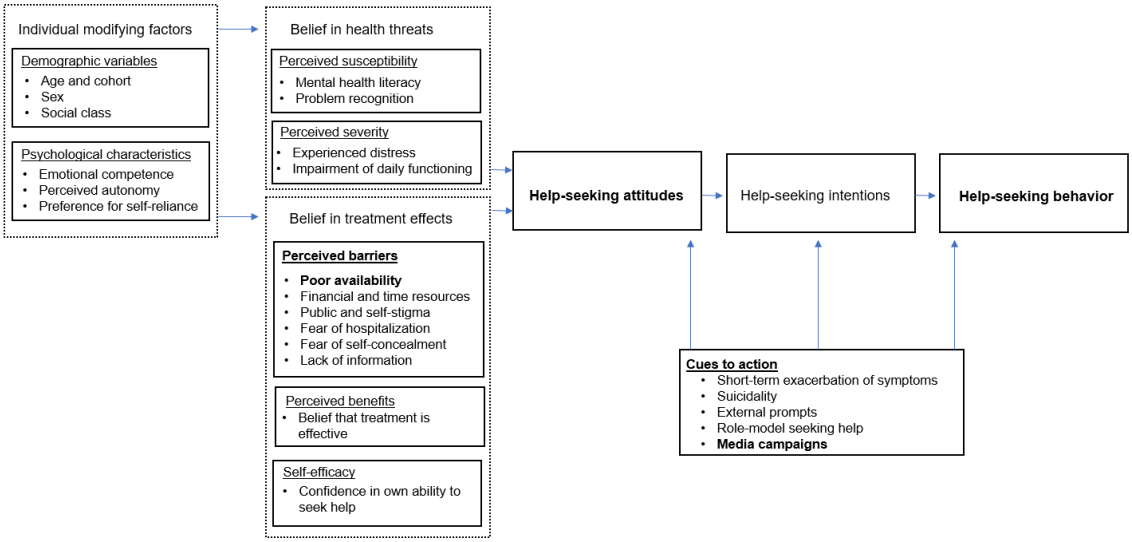

Figure 4. Integrative socio-cognitive model of the help-seeking process for mental health problems applied to manuscript 3.

4.4 Manuscript 4: Help-seeking duration in adolescents with suicidal behavior and non-suicidal self-injury

Lustig, S., Koenig, J., Resch, F., & Kaess, M. (2021). Help-seeking duration in adolescents with suicidal behavior and non-suicidal self-injury. *Journal of Psychiatric Research, 223,* 60-67.

In addition to the problem that many young people with mental health problems do not seek professional help at all, another circumstance that makes it difficult to provide effective treatment to individuals with mental health problems is the help-seeking delay for those that seek help eventually. Although the importance of rapid help for adolescent mental health has been demonstrated in various studies (Melle et al., 2008; Nery-Fernandes et al., 2012), to date, little research has been conducted on help-seeking duration among youth with mental health problems.

Therefore, the present study addresses the help-seeking duration of adolescents with suicidal behavior and non-suicidal self-injury. Data from the ongoing AtR!Sk cohort-study at the outpatient clinic for risk-taking and self-harm behaviors (AtR!Sk; Ambulanz für Risikoverhalten & Selbstschädigung; Kaess, Ghinea, Fischer-Waldschmidt, & Resch, 2017), conducted at the University Hospital Heidelberg, were utilized to analyze help-seeking duration and help-seeking delay as well as factors that may influence or follow delayed help-seeking. The investigated sample included *N* = 672 children and adolescents aged 11 to 19 years who have

sought help for their engagement in risk-taking and self-harm behavior. A measure of help-seeking duration was calculated from initial onset of thoughts and incidents of self-harm until first clinical presentation.

The analyses showed that in 22% of the cases, self-harm thoughts and behaviors occurred for the first time after there had already been contact with professional help. This illustrates the complexity of the course of mental illness, especially in adolescence, and shows that even after initially successful help-seeking behavior, the illness is not conquered and new symptoms can arise. Considering only those cases in which the first seeking of professional help occurred after the onset of symptoms, there was a help-seeking delay between *M* = 0.99 years (after first suicide attempt) and *M* = 1.98 years (after first thoughts of self-injury). Given that all of the youth in this sample suffered from suicidal behavior or from non-suicidal self-injury, these long delays in the help-seeking process are alarming. It was also found that the delay was longer among those with particularly severe distress (i.e., diagnosis of BPD, more depressive symptoms, higher general symptom severity).

In light of the integrative social-cognitive model, this study particularly highlights the importance of *perceived severity* in the help-seeking process. Participants who perceived greater distress in themselves took longer to seek professional help. This finding initially appears contradictory within the framework of the model, in which higher perceived severity would tend to be associated with increased help-seeking behavior. The results could be interpreted as a confirmation of the help negation effect, in which extremely high stress blocks help-seeking behavior (Wilson & Deane, 2011). However, it is more likely that at this point the causal relationship is reversed, and symptoms have worsened because of the prolonged help-seeking delays. Thus, the present study illustrates how essential it is to provide rapid and adequate care for adolescents with mental health problems.

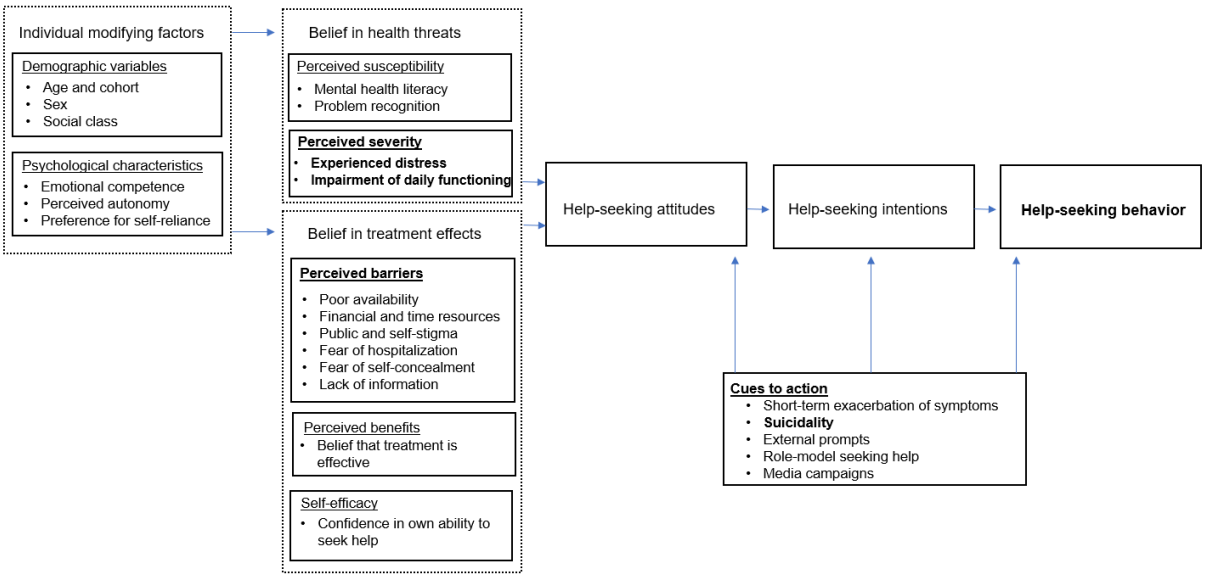

Figure 5. Integrative socio-cognitive model of the help-seeking process for mental health problems applied to manuscript 4.

5. Discussion

The purpose of the present work was to gain a better understanding of the help-seeking process of adolescents with mental health problems. To this end, a theoretical model was developed that differentiates the main factors influencing help-seeking behavior. In addition, various components of this integrative social-cognitive model of the help-seeking process for mental health problems were examined in four scientific studies, thus identifying and implementing essential starting points for improving adolescent help-seeking behavior.

The integrative socio-cognitive model of the help-seeking process for mental health problems combines the HBM and TPB into a comprehensive model in which the help-seeking process is broken down into the relevant influencing variables. The model aims to consider all relevant factors and yet not to become too specific, so that it can be applied in different areas. The processes described can be applied to adolescents with manifest mental health problems, as in the studies presented. However, it would also be applicable to adults, to people with varying degrees of mental distress, and, in addition to seeking professional help, to the use of informal help services.

There are other models that have attempted to embed the help-seeking process within a theoretical framework, but these are often relatively specialized and thus less universally applicable (Henshaw & Freedman-Doan, 2009; Pescosolido & Boyer, 1999; Rickwood et al., 2005). For example, cognitive theories often assume that help-seeking is a volitional process, ignoring the effect of external variables (*cues to action*). Naturally, the integrative model proposed here also has its limitations; for example, it does not allow prediction of long-term behavior and thus cannot explain adherence to treatment, nor can it predict which individuals will benefit from treatment once it has been sought out. Moreover, the integrative socio-cognitive model fits mainly the initial initiation of help-seeking. Renewed help-seeking for mental health problems is probably subject to other mechanisms. However, it can already be deduced from the model that a renewed help-seeking process will be easier after the first contact, because positive past experience will strengthen self-efficacy (Hom et al., 2015). In general, abstracting reality to a theoretical level always means simplification. On the other hand, this also means that the integrative socio-cognitive model of the help-seeking process can be applied to many different areas, making it a good basis for planning and evaluating further interventions to promote the help-seeking process.

The four scientific studies presented in this paper contribute to a better understanding and targeting of help-seeking behavior among adolescents with mental health problems. The findings on the ProfScreen intervention from the SEYLE study indicate that school-based interventions are a useful approach to strengthening help-seeking behavior among youth

(Manuscript 1). Promoting the *perceived susceptibility* through the interview with a professional counselor motivated some youth to seek professional treatment. At the same time, this research revealed an existential problem, namely the low uptake of the ProfScreen intervention itself. Interventions to improve help-seeking thus face the same problems as the help services itself: *Perceived barriers* prevent youth from seeking professional help but also from accepting support services on the path to help-seeking. In the SEYLE study, structural barriers such as distance were found to negatively influence intervention uptake (Kaess et al., 2014). Although psychological barriers such as fear or stigma were not explicitly captured in the SEYLE study, these also likely contributed to the fact that many youths did not take advantage of the effective intervention offered despite an existing need.

The factor of psychological *perceived barriers* (e.g. public and self-stigma or lack of information) played a special role in the presented ProHEAD study (Manuscript 2). The Internet-based ProHEAD interventions are designed to overcome not only the structural barriers, but also the psychological barriers. To better understand the importance of psychological barriers, the school-based screening in ProHEAD includes a questionnaire on perceived barriers to seeking professional support. This is also used longitudinally over a year in the ProHEAD intervention presented here, in order to record and target individual barriers. In addition to *perceived barriers*, the ProHEAD intervention also addresses *perceived benefits* (e.g. via psychoeducation) and *perceived susceptibility* (e.g. via individual screening feedback). By addressing so many factors of the help-seeking process simultaneously in ProHEAD, it should be possible to demonstrate a good effect on adolescents' help-seeking behavior. Other studies have already identified this type of non-confrontational, psychoeducational, Internet-based approach as promising (Henshaw & Freedman-Doan, 2009; Kauer et al., 2014; O'Connor et al., 2014). The next months will show whether ProHEAD can actually implement these ideas successfully. The study will run until the end of 2022 and the evaluation of the follow-up results will then show whether the intervention was able to improve the help-seeking behavior and, above all, the mental health of the young people.

Preliminary results from the ProHEAD study are already available on baseline data from the first wave of the COVID-19 pandemic (Manuscript 3). On the one hand, this study illustrates the topicality of Internet-based approaches. Young people already like to use the Internet for health-related topics, but during the pandemic, the Internet became even more relevant as a substitute for limited face-to-face contact. This was also reflected in an increased use of the ProHEAD online intervention during the first wave of the COVID-19 pandemic (Kaess et al., 2020). In addition, the findings of the ProHEAD study from the first wave of the pandemic highlight the particular importance of help-seeking attitudes. It was shown that attitudes can

change very dynamically, which makes them a good starting point for improving health care for adolescents with mental health problems as a precursor to actual help-seeking.

The presented results on help-seeking duration from the AtR!Sk outpatient clinic reveal a substantial delay in the help-seeking process of adolescents with suicidal behavior and non-suicidal self-injury (Manuscript 4). The elements of the integrative socio-cognitive model of the help-seeking process help in understanding not only whether or not someone will seek help, but also how quickly that happens. Here, *perceived severity* in particular is a crucial factor. Although many studies suggest that increased symptom burden contributes to faster help-seeking (Leaf et al., 1988; Wang et al., 2000), the present study shows an inverse relationship. It is possible that in this case, delayed help-seeking leads to worsening of symptoms, as has already been confirmed for some disorders (Lieberman & Fenton, 2000; Ricky, Siobhan, Nawaf, & Elliot M., 2017). Overall, the issue of high help-seeking delays highlights the importance of targeted interventions that support the path to professional help for adolescents with mental health problems - especially when prolonged delays lead to youth becoming even more distressed.

When interpreting the results from the four publications presented, some methodological limitations must be considered. In particular, for both the studies on help-seeking delay (Manuscript 4) and the preliminary results from ProHEAD (Manuscript 3), it is important to note that only cross-sectional data are available so far. Based on these data, it is not possible to draw any conclusions about causal relationships. A reliable evaluation of the ProHEAD intervention can only be made after the completion of follow-up surveys, and longitudinal studies should be designed for robust data on the help-seeking delay. In addition, the specifics of the samples in both Manuscript 3 and Manuscript 4 must be considered. The results on the impact of the COVID-19 pandemic on participation in ProHEAD are based on the comparison of relatively small samples. The sample from AtR!Sk, from which the results regarding the help-seeking delays were drawn, was larger, but relatively special in composition. Only adolescents dealing with suicidality or non-suicidal self-injury were included here, and those who participated were predominantly female, which limits the generalizability of the results. Another limitation regarding the help-seeking delay data is the retrospective recording of the first onset of mental health problems. Even if suicidal thoughts and actions are memorable experiences, it must be assumed that the adolescents cannot remember exactly at what time they first occurred for all instances.

On the other hand, the samples in SEYLE (Manuscript 1) and also for the ProHEAD overall study (Manuscript 2) are very large, which can be a major methodological strength. In SEYLE, 12,395 students from 11 European countries participated in the study and 4,172 took part in

the ProfScreen intervention presented here. In ProHEAD, the sample is not yet final, but to date over 9,000 children and adolescents completed the baseline questionnaire. The large sample sizes result from the school-based approaches, offering the potential for representative sample compositions and allowing robust statistical analyses. At the same time, such large-scale studies also pose risks: Although attempts were made to align the implementation of the project across countries, there might have been differences between countries in the SEYLE study. In some countries there were many missing values, which made some results from the overall sample less reliable, and in some cases data from individual countries had to be excluded. In addition, in large-scale studies such as ProHEAD and SEYLE, there is often a self-selection bias for participation in the study. In the SEYLE study, for example, 76% of the invited students participated, which means that 24% did not take up the offer in the first place (Carli et al., 2013). In ProHEAD, it was found that there was a tendency for adolescents who were more severely burdened to participate. This became evident when preliminary evaluations of the allocation to the ProHEAD intervention arms after the first n = 1,500 participants demonstrated that many more participants than expected were classified as “in need of treatment”, a classification that was based on well-established norms. Therefore, school-based services such as SEYLE and ProHEAD are a good opportunity to reach those who need professional support, but in order to be effective as prevention, the services must become even lower-threshold. Even studies that were explicitly designed to reach youth as low-threshold as possible struggle with relatively low take-up. This again shows how fundamental it is to better understand the help-seeking process of adolescents with mental health problems and how essential it is to identify possible starting points to improve health care for this group.

Besides the large sample sizes, another strength of the studies presented here is that actual help-seeking behavior was recorded as an outcome variable. As described earlier, this is not the case in much research on help-seeking behavior. However, even in ProHEAD and in the data presented from AtR!Sk, behavior was only recorded via information in the questionnaire, which may not be a reliable source in every case. Optimally, actual behavior should be observed, as was the case with ProfScreen.

6. Implications and directions for future research

By presenting the integrative socio-cognitive model and the four empirical studies, the present work enables a better understanding of the help-seeking process of adolescents with mental health problems. At the same time, this work identifies several entry points where further research can be conducted to specifically improve the health care of adolescents.

It has been broadly illustrated that school-based studies offer a good approach to reaching large numbers of adolescents and that they can overcome many barriers to uptake through targeted design. Future projects should not only minimize structural barriers, but should pay particular attention to the psychological barriers that may prevent young people from participating in the intervention. Here, targeted campaigns to destigmatize mental illness are particularly necessary, both to increase the uptake of interventions for referral and prevention, but also to facilitate the use of professional help for mental health problems in a direct way. In addition, it is becoming increasingly clear, also in the wake of the COVID-19 pandemic, that online-based offerings should be an essential component of future health promotion measures. The effectiveness of telemedicine services for mental health problems needs to be examined in further research. Particular attention should be paid to online services which can serve as door openers to established face-to-face contact points.

All the studies presented showed that help-seeking among adolescents does not yet function sufficiently well and that a substantial proportion of mentally distressed adolescents do not seek help, or wait a very long time before doing so. In addition to efforts to convince young people to seek professional help in the first place, it is also important to shorten the existing delay. To this end, help-seeking duration and possible correlates in young people should be intensively studied. More research is needed here to capture the delay not only for suicidality and non-suicidal self-injury but also for other medical conditions. In particular, longitudinal studies are needed to identify causal relationships and derive targeted measures to shorten help-seeking delays in young people.

Future research on help-seeking behavior among adolescents should also be embedded in a theoretical framework. The integrative socio-cognitive model of the help-seeking process among adolescents with mental health problems could provide a unifying foundation. The relationships assumed in the model, e.g., the exact mechanisms of *cues to action* on help-seeking attitudes, intentions, and behaviors, should be empirically examined in further research.

Overall, the present dissertation project provides a theoretical and practical overview of the broad field of help-seeking by adolescents with mental health problems. Therefore, it makes a significant contribution to the research field of help-seeking behavior in children and adolescents by providing a framework for further research to develop and implement meaningful interventions. Furthermore, by including very large samples of children and adolescents from across Germany and Europe, this dissertation project gathered valuable information about the state of young people's mental health, as well as their attitudes and behaviors in this regard. In addition, large-scale projects to improve mental health and help-

seeking behavior were implemented and monitored, and first data on help-seeking delay among adolescents with suicidal thoughts and behaviors were published. In the scientific studies presented, numerous starting points for improving health care for troubled youth have been identified and addressed. Future research should use these findings to develop measures to make it easier for young people with mental health problems to access professional support. In this way, research on the help-seeking process of adolescents with mental health problems can help make the health care system more efficient and to ultimately improve the mental health of future generations.

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The Impact of School-Based Screening on Service Use in Adolescents At-Risk for Mental Health Problems and Risk-Behaviour

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Abstract

Early detection and intervention can counteract mental disorders and risk-behaviours among adolescents. However, help-seeking rates are low. School-based screenings are a promising tool to detect adolescents at risk for mental problems and to improve help-seeking behaviour. We assessed associations between the intervention ”Screening by Professionals” (ProfScreen) and the use of mental health services and at-risk state at 12-month follow-up compared to a control group.

School students (aged 15±0.9 years) from 11 European countries participating in the “Saving and Empowering Young Lives in Europe” (SEYLE) study completed a self-report questionnaire on mental health problems and risk-behaviours. ProfScreen students considered “at-risk” based on the screening were invited for a clinical interview with a mental health professional and, if necessary, referred for subsequent treatment. At follow-up, students completed another self-report, additionally reporting on service use.

Of the total sample (*N*=4,172), 61.9% were considered at-risk. 40.7% of the ProfScreen at-risk participants invited for the clinical interview attended the interview, and 10.1% of subsequently referred ProfScreen participants engaged in professional treatment. There were

no differences between the ProfScreen and control group regarding follow-up service use and at-risk state. Attending the ProfScreen interview and being referred to subsequent treatment was positively associated with follow-up service use (OR=2.747, 95%CI=1.457-5.181), associations with follow-up at-risk state were ambiguous.

Service use rates of professional care as well as of the ProfScreen intervention itself were low. School-based interventions targeting help-seeking can be effective if participants take full advantage of them. Future studies need to target barriers to intervention adherence.

Clinical Trials Registration: The trial is registered at the US National Institute of Health (NIH) clinical trial registry (NCT00906620, registered on 21 May, 2009), and the German Clinical Trials Register (DRKS00000214, registered on 27 October, 2009).

Keywords: adolescents, mental health problems, risk-behaviours, school-based screening, service use

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York, US; the SEYLE Consortium comprises sites in twelve European countries. Site leaders are Danuta Wasserman (NASP, Coordinating Centre), Christian Haring (Austria), Airi Varnik (Estonia), Jean-Pierre Kahn (France), Romuald Brunner (Germany), Judit Balazs (Hungary), Paul Corcoran (Ireland), Alan Apter (Israel), Marco Sarchiapone (Italy), Doina Cosman (Romania), Vita Postuvan (Slovenia) and Julio Bobes (Spain). All authors confirm that there is no potential, perceived, or real conflict of interest. Special acknowledgments regarding the study go to all staff and participants that were involved in data collection. We wish to thank the staff of the Vadaskert Child Psychiatric Hospital, Budapest for the collaboration. Special acknowledgments regarding this manuscript go to Katja Klug, Gloria Fischer-Waldschmidt and Lisa Gobelbecker from the University of Heidelberg, Germany, for their extensive help in the development and evaluation of the professional screening procedure during the SEYLE study; and to Radoslaw Panczak from the University of Queensland, Australia, for his inputs regarding statistical methods and analyses.

Introduction

Mental disorders cause a high burden in children and adolescents. Among the ten leading causes of disease burden in 10-24-year olds, five are related to mental and substance use disorders [1]. Another four, such as road-traffic accidents and HIV/AIDS [1], may be directly or indirectly related to risk-behaviour. Furthermore, risk-behaviours and poor mental health of young people are often correlated [2–6]. For example, adolescents' depressive symptoms are associated with multiple risk-behaviours [7]. Early detection and intervention might reduce the burden of mental disorders for individuals and societies [8]. Since many lifetime mental disorders begin in childhood or adolescence [9, 10] and often continue through the life course, early detection and subsequent intervention has an even bigger impact in this age group [8].

Despite the high need, young peoples' help-seeking behaviour within the mental healthcare system is remarkably low [11–14]. These low help-seeking rates might be one reason why the

burden of mental disorders does not reduce in children and adolescents. The focus on how young people's help-seeking behaviour could be increased is thus warranted. School-based screenings may be promising tools to detect young people at-risk for mental health problems and risk-behaviour [15–19] that are sometimes not otherwise identified [20]. Accordingly, they have the potential to increase subsequent help-seeking behaviour [11], and thus indirectly reduce mental health problems. Schools are an obvious and acceptable environment for prevention and intervention [17, 21] and school-based mental health professionals are perceived helpful by high-school students [22]. School-based screenings usually involve two stages [17, 23, 24] and have shown to be clinically valid and reliable [25, 26]. First, all students complete a brief self-report screening instrument to detect those at-risk for mental problems or risk-behaviour. Second, those considered at-risk, based on the self-report, are invited to attend a clinical face-to-face interview with a mental health professional; this aims to identify those that require ongoing support [17, 27] and, if needed, refers them to a subsequent intervention.

School-based screenings addressing current suicidality have shown to be associated with help-seeking at a later time [11]. If screenings addressing a wider array of mental health problems and risk-behaviours are associated with help-seeking in a similar way is yet unknown. School-based screenings are a crucial part of indicated preventions aiming at individuals with subclinical symptoms. They might not only be associated with service use but also, at least indirectly, with follow-up at-risk states. To the best of our knowledge, this has not yet been studied.

Within the framework of the "Saving and Empowering Young Lives in Europe" (SEYLE) study [28], a two-stage school-based screening for mental health problems and risk-behaviour was implemented in a large sample of European adolescents. The present study reports on the one-year follow-up of those at-risk at baseline assessment that were randomly assigned to either the two-staged screening intervention *Screening by Professionals* (ProfScreen) or

the control group. We aimed to illustrate advantages and disadvantages of school-based screenings by addressing following research questions:

(1) Compared with the control group and/or those not completing the intervention, is complete participation in the ProfScreen intervention associated with higher levels of service use?

(2) Compared with the control group and/or those not completing the intervention, is complete participation in the ProfScreen intervention associated with reduced follow-up at-risk state?

Methods

Study design

The SEYLE study is aimed at the prevention and early intervention of mental problems, suicide, and risk-behaviours [registered at the US National Institute of Health (NIH) clinical trial registry (NCT00906620), and the German Clinical Trials Register (DRKS00000214)]. SEYLE is a randomized controlled trial (RCT) including three different school-based interventions and one control group. For the present study, only participants who were randomized to either the ProfScreen intervention or the control group were included. Wasserman and colleagues described details of methodology and interventions of the SEYLE study, including the other two intervention groups, the gatekeeper training *Question, Persuade, and Refer* (QRF) and the awareness training *Youth Aware of Mental Health Programme* (YAM) [28]. Eleven countries including Austria, Estonia, Germany, France, Hungary, Ireland, Israel, Italy, Romania, Slovenia, and Spain implemented the SEYLE study, with Sweden as the coordinating centre. Ethical approval was granted locally to each study site. The selection of the countries allowed for a broad geographical representation of Europe. In each country, researchers randomly selected mixed-gender post-primary schools within a

pre-determined and representative study site. Of the total 264 schools that were approached for participation, 179 schools accepted (overall response rate was 67.8%). The participating schools were randomly assigned to one of the three interventions or to the control group. Only one type of intervention was performed in each school to avoid contamination and confounding. Students and teachers were only aware of the respective intervention arm implemented at their school, without being informed of other intervention arms implemented at other schools. Assessments and interventions were homogenous and robust across countries (for more details on methods including randomisation process of the SEYLE study, see [29]). Inclusion criteria for the current study were: (1) being randomised to either ProfScreen or control group, and (2) screening positive for mental health problems and/or risk behaviour at baseline. Students that reported current suicidality at baseline (emergency cases) received an immediate, special intervention [25]. They remained in the study but were excluded from analyses (Figure 1).

Screening by Professionals (ProfScreen) and control group/minimal intervention

The ProfScreen intervention was designed to identify students at-risk for mental problems or risk-behaviours and followed a two-stage screening process: (1) students' self-report; (2) clinical evaluation and referral to a healthcare service for treatment, if necessary. The University of Heidelberg and the National Swedish Prevention of Mental Ill-Health and Suicide (NASP) at the Karolinska Institutet developed this intervention, and it was pilot tested in Heidelberg. Students of the ProfScreen group that screened at or above at least one of the eleven pre-defined cut-off points in the school-based screening (see Online Resource 1; all Online Resources are provided in online Supporting Information) [23, 28] were invited to attend a clinical semi-structured interview with a psychologist or psychiatrist. The interview was developed based on the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS) [30]. It was designed to distinguish between students that required further mental healthcare due to their psychological problems and those who did not, rather than determining clinical diagnoses. For ethical reasons, the control group received minimal

intervention comprising six educational posters displayed in the class rooms [25]. Both ProfScreen and minimal intervention took place within four weeks after the baseline assessment.

School-based assessments

For the first stage of the screening process, students completed a 60-90-minute self-report questionnaire in a school-based setting, on mental health problems (depression, anxiety, suicidal tendencies, non-suicidal self-injury, and eating behaviour) and risk-behaviours (sensation seeking, delinquent behaviour, substance abuse, media exposure, social relationships, bullying, and school attendance). This baseline questionnaire additionally assessed students' socio-demographics [28]. The instruments used were validated and/or used in previous studies (see Online Resource 1). Several child and adolescent psychologists and psychiatrists of the SEYLE consortium agreed on the cut-off points, during a consensus conference.

The same scales were used to assess mental health problems and risk-behaviours at 12-month follow-up. Additionally, participants indicated if and what type of service or support they received since the implementation of the ProfScreen or minimal intervention (control group) at baseline. Possible answers included help from health professionals (medication, professional one-on-one therapy, group therapy, or advice from a health professional), and help from the lay support system (healthy lifestyle group or a mentor to talk to).

Statistical analyses

Descriptive statistics were calculated separately for participants of the ProfScreen and the control group regarding socio-demographic variables, screening parameters, and follow-up at-risk state. Additionally, the number of interview attendees (ProfScreen completers) and subsequent referrals (referred ProfScreen completers) was calculated for the ProfScreen group. For baseline differences and effect sizes regarding socio-demographic variables and

screening parameters between participants from ProfScreen and the control group, independent t-tests were implemented for continuous variables after confirming that they met the required assumptions. Categorical variables were compared with Chi-square tests.

To evaluate the effects of the ProfScreen intervention on at-risk state and service use, the binary variables 'at-risk baseline' and 'at-risk follow-up' were created, describing whether participants did (*yes*), or did not meet (*no*) at least one of the eleven pre-defined cut-off points (see Online Resource 1). The variable 'service use' reflected if the participants received help from a health professional (*yes*), or if they sought help within the lay support system or did not seek any help (*no*). Simultaneous logistic regression was used to model the effect of the ProfScreen intervention on follow-up service use (research question 1; adjusted for age, sex, and baseline screening parameters) and on follow-up at-risk state (research question 2; adjusted for age and sex only, as baseline screening parameters were part of the criteria for at-risk status).

An additional variable was created to further evaluate the effects of the ProfScreen intervention for those that actively participated in the intervention: The variable 'referred ProfScreen completers' differentiated between students of the ProfScreen group that attended the stage-two ProfScreen interview and were referred to subsequent treatment (*yes*), and ProfScreen participants that did not complete the two-stage screening, were not referred or were in the control group (*no*).

Associations between the variables 'referred ProfScreen completers' and 'service use' were modelled using simultaneous logistic regression and adjusted for age, sex, and baseline screening parameters (research question 1). Similarly, simultaneous logistic regression adjusted for age, sex, and service use was used to model the association between the variables 'referred ProfScreen completers' and 'follow-up at-risk state' (research question 2).

Each variable had between 0% and 8.7% missing values (see Online Resource 2). First, we removed participants with missing age and sex. Second, we analysed patterns of the

missing outcome follow-up at-risk state according to age, sex, intervention group, and country (see Online Resource 3). Then, we analysed complete cases. For the outcome follow-up at-risk state, we additionally conducted sensitivity analyses excluding countries (Ireland, Israel, Romania, and Spain) with above average missing data. Results with $p \leq 0.05$ were considered statistically significant. The statistical analyses were performed using Stata version 15 (Stata Corporation, College Station, TX, USA).

Results

Description of samples and baseline differences between the ProfScreen and control group

Of the total N=12,395 SEYLE study participants, 3,070 were randomised to the ProfScreen and 3,257 to the control group. Of those, 4,172 (65.9%) completed the 12-month follow-up, were not emergency cases, and had complete data. Among those complete cases, 2,583 (61.9%) students were considered at-risk for mental problems or risk-behaviour at baseline; comprising 1,314 (50.9%) students of the ProfScreen and 1,269 (49.1%) of the control group. 535 (40.7%) students of the ProfScreen group attended the clinical interview and 149 (27.9%) of these were referred to subsequent treatment (Figure 1).

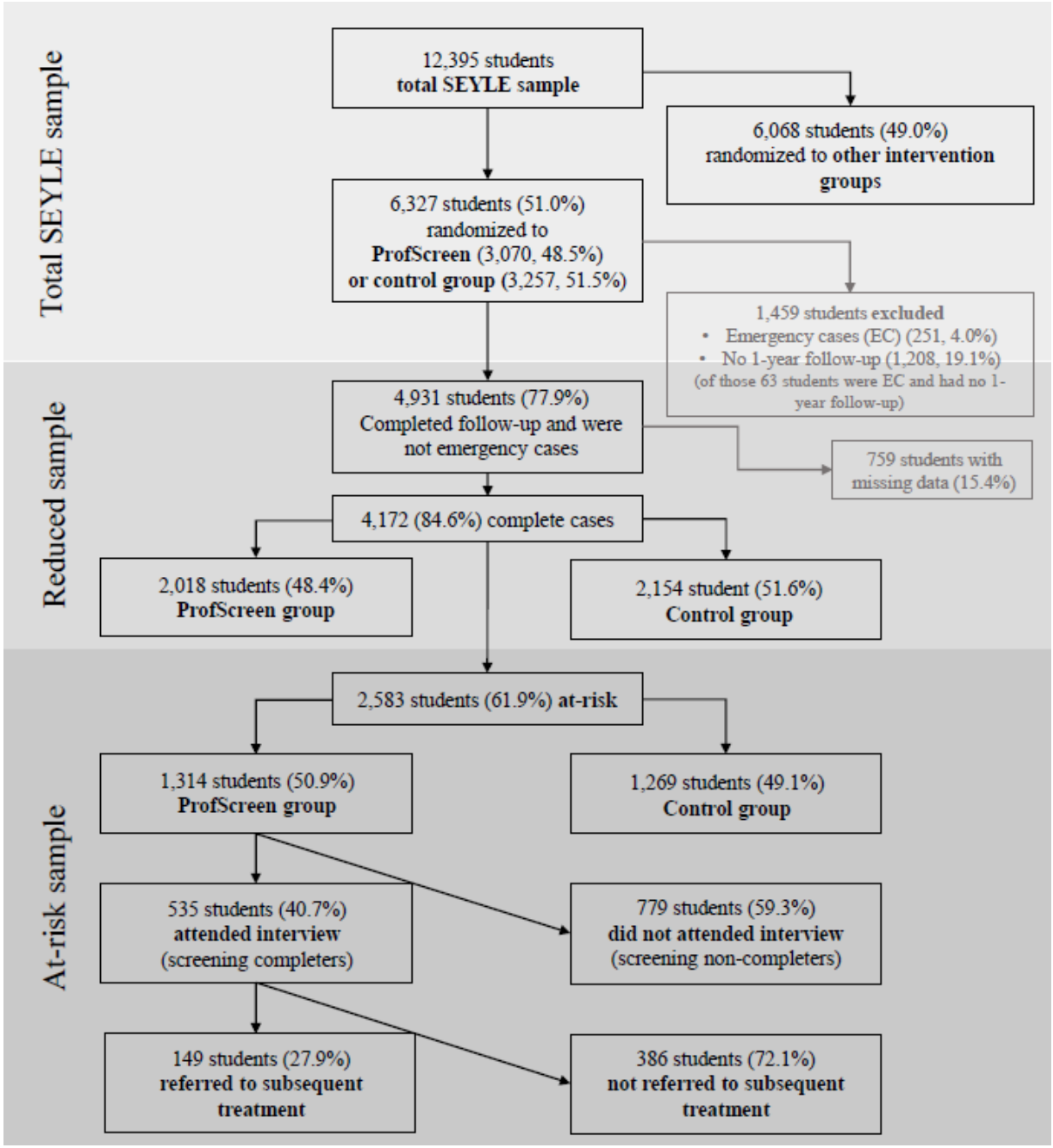

Fig.1 Flow-chart of recruitment and participation of students in SEYLE study, participation on screening process at baseline (11/2009-12/2010) and completion of follow-up questionnaire (12 month after baseline)

Subsequent data analyses refer to the 2,583 students that were at-risk for mental health problems or risk-behaviour at baseline. Compared to the control group, students of the ProfScreen group screened more often positive for suicidal tendencies and problems in social relationships at baseline (Table 1). The effect sizes of these differences were small. Sex, age,

and all other baseline screening parameters did not differ between the ProfScreen and control group (Table 1).

Table 1 Sociodemographic and clinical characteristics of the total at-risk sample and statistical comparison of the ProfScreen and control group

	Total at-risk sample (N=2,583)	ProfScreen group (n=1,314)	Control group (n=1,269)	Statistics[b] $\chi^2_{(df)}$, p, Cramer's V[c] / $t_{(df)}$, p, Cohen's d[d]
Sex, n (%)				
Female	1,422(55.1)	743(52.3)	679(47.7)	$\chi^2_{(1)}$=2.408, p=0.121, V=0.031
Age: mean±SD	15±0.9	15±0.9	15±0.9	$t_{(2581)}$=-0.129, p=0.898, d=-0.005
Baseline screening parameters, n (%) *yes*				
Depression	680(26.3)	348(51.2)	332(48.8)	$\chi^2_{(1)}$=0.052, p=0.820, V=0.005
Anxiety	250(9.7)	134(53.6)	116(46.4)	$\chi^2_{(1)}$=0.733, p=0.392, V=0.017
Suicidal tendencies	509(19.7)	279(54.8)*	230(45.2)*	$\chi^2_{(1)}$=5.388, p=0.020, V=0.046
Non-suicidal self-injury	518(19.3)	278(53.7)	240(46.3)	$\chi^2_{(1)}$=2.241, p=0.134, V=0.030
Eating behaviour	176(6.8)	81(46.0)	95(54.0)	$\chi^2_{(1)}$=2.491, p=0.114, V=-0.032
Risky behaviour[a]	313(12.1)	152(48.6)	161(51.4)	$\chi^2_{(1)}$=0.718, p=0.397, V=-0.017
Substance abuse	1,456(56.4)	740(50.8)	716(49.2)	$\chi^2_{(1)}$=0.020, p=0.889, V=-0.003
Exposure to media	452(17.5)	216(47.8)	236(52.2)	$\chi^2_{(1)}$=2.420, p=0.120, V=-0.031
Social relationships	204(7.9)	126(61.8)*	78(38.2)*	$\chi^2_{(1)}$=10.551, p=0.001, V=0.064
Bullying	328(12.7)	178(54.3)	150(45.7)	$\chi^2_{(1)}$=1.785, p=0.181, V=0.027
School attendance	119(4.9)	61(51.3)	58(48.7)	$\chi^2_{(1)}$=0.005, p=0.942, V=0.001
Interview attended, n (%) *yes*	*NA*	535(40.7)	*NA*	*NA*
Referred ProfScreen completers, n (%) *yes*	*NA*	149(11.3)	*NA*	*NA*

NA not applicable: Interview attendance and referral to further treatment is only applicable to ProfScreen group, *p* p-value, $\chi^2_{(df)}$ Chi-squared test for categorical data with degrees of freedom, $t_{(df)}$ independent t-test with degrees of freedom

* residuals in cells > 1.96 or <-1.96 (indicates that frequency in cell is significantly larger or smaller than expected).

[a] Sensation seeking and delinquent behaviour

[b] parameter comparisons between ProfScreen and control group

[c] Cramer's *V* of 0.1, 0.3, and 0.5 represent small, medium, and large effect size, respectively

[d] Cohen's *d* of 0.2, 0.5, and 0.8 represent small, medium, & large effect sizes; Rosenthal's *r* of 0.1, 0.2, and 0.5 represent small, medium, and large effect size, respectively

Effects of the ProfScreen intervention

Of the total 2,583 students at-risk for mental health problems or risk-behaviour, 93 (3.6%) engaged in professional treatment within one year after the baseline assessment; 53 (4.1%) of the ProfScreen and 40 (3.1%) of the control group. Most of these students engaged in professional one-to-one therapy, followed by medication (see Online Resource 4). Neither follow up service use (Table 2, unadjusted models in Online Resource 5) nor follow up at-risk state (Table 3, unadjusted models in Online Resource 6) differed significantly between the ProfScreen and the control group. Looking only at the 149 referred ProfScreen completers,

15 (10.1%) engaged in professional treatment. Referred ProfScreen completers had higher odds of engaging in service use with a professional, within one year after the intervention, than non-referred ProfScreen completers, ProfScreen non-completers and the control group (Table 4, unadjusted models in Online Resource 5).

Table 2 Adjusted logistic regression of association between ProfScreen intervention and service use

	Service use after one year	
	OR	95% CI
ProfScreen group [a]	1.401	0.885-2.218
Age[b]	1.067	0.817-1.394
Sex[c]	1.396	0.835-2.334
Baseline screening parameters[d]		
Depression	**1.958**	1.137-3.372
Anxiety	1.215	0.628-2.351
Suicidal tendencies	1.121	0.641-1.962
Non-suicidal self-injury	**2.418**	1.480-3.972
Eating behaviour	1.627	0.663-3.996
Risky behaviour[e]	1.483	0.783-2.807
Substance abuse	1.157	0.713-1.878
Exposure to media	1.075	0.577-2.004
Social relationships	0.823	0.386-1.755
Bullying	1.417	0.780-2.525
School attendance	1.177	0.432-3.213

OR odds ratio, *CI* confidence interval, statistically significant results are displayed in **bold**, Pseudo R^2=0.064

[a] Reference category: control group

[b] Reference: younger age

[c] Reference category: male

[d] Reference categories: cut-offs for mental problems or risk-behaviours not met

[e] Sensation seeking and delinquent behaviour

Table 3 Adjusted regression of association between ProfScreen intervention and follow-up at-risk state

	Follow-up at-risk state	
	OR	95% CI
ProfScreen group[a]	0.988	0.742-1.316
Service use[b]	**2.529**	**1.336-4.787**
Age[c]	1.067	0.963-1.182
Sex[d]	**0.722**	**0.554-0.941**

OR odds ratio, *CI* confidence interval, statistically significant results are displayed in **bold**, Pseudo R^2=0.010

[a] Reference category: control group

[b] Reference category: no service use

[c] Reference: younger age

[d] Reference category: male

Table 4 Adjusted logistic regression of association between ProfScreen intervention and service use for referred ProfScreen completers

	Service use after one year	
	OR	95% CI
Referred ProfScreen completer [a]	**2.747**	1.457-5.181
Age [b]	1.034	0.791-1.351
Sex [c]	1.427	0.851-2.394
Baseline screening parameters [d]		
Depression	**1.860**	1.084-3.192
Anxiety	1.158	0.598-2.246
Suicidal tendencies	1.109	0.635-1.937
Non-suicidal self-injury	**2.344**	1.437-3.822
Eating behaviour	1.514	0.613-3.740
Risky behaviour [e]	1.380	0.722-2.636
Substance abuse	1.157	0.710-1.883
Exposure to media	1.064	0.570-1.987
Social relationships	0.815	0.382-1.738
Bullying	1.449	0.813-2.583
School attendance	1.202	0.440 -3.286

OR odds ratio, *CI* confidence interval, statistically significant results are displayed in **bold**, Pseudo R^2=0.073

[a] Reference category: not referred ProfScreen and control group participants

[b] Reference: younger age

[c] Reference category: male

[d] Reference categories: cut-offs for mental problems or risk-behaviours not met

[e] Sensation seeking and delinquent behaviour

The majority (76.0%) of the total baseline at-risk sample was still at-risk at 12-month follow-up (Table 1). Referred ProfScreen completers had higher odds of having at-risk state at 12-month follow-up than non-referred ProfScreen completers, ProfScreen non-completers and the control group (Table 5, unadjusted models in Online Resource 6). Sensitivity analyses showed that when countries with above average missing data on the outcome at-risk follow-up (n=1,799) were excluded, referral was no longer significantly associated with having at-risk state at 12-month follow-up (see Online Resource 7).

Table 5 Adjusted regression of association between ProfScreen intervention and follow-up at-risk state for referred ProfScreen completers

	Follow-up at-risk state	
	OR	95% CI
Referred ProfScreen completers[a]	**1.628**	**1.038-2.552**
Service use[b]	**2.391**	**1.262-4.530**
Age[c]	1.061	0.958-1.176
Sex[d]	**0.680**	**0.565-0.819**

OR odds ratio, *CI* confidence interval, statistically significant results are displayed in **bold**, Pseudo R^2=0.011

[a] Reference category: not referred ProfScreen and control group participants

[b] Reference category: no service use

[c] Reference: younger age

[d] Reference category: male

Discussion

Our study on the school-based ProfScreen intervention had four main findings: (1) Service use rates for professional mental health services were low, even among adolescents who were referred to professional treatment for their mental health problems and risk-behaviours; (2) referred ProfScreen completers were more likely to engage in services with a health professional than non-referred ProfScreen completers, ProfScreen non-completers and participants from the control group, while it remained unclear whether ProfScreen referral was associated with 12-month follow-up at-risk state; (3) assignment to the ProfScreen intervention per se had no effect on follow-up service use nor at-risk state; (4) participation rates within the ProfScreen intervention itself were low. Overall, the present study demonstrated that school-based screenings have the potential to improve service use among adolescents with mental health problems, but only if they actively participate in the intervention offered. Furthermore, our study demonstrated potential difficulties that two-stage school-based screenings with clinical evaluation by a professional might face.

In general, service use rates for adolescents at-risk for mental health problems were low with only 3.6% seeking professional help. Looking only at participants who were referred to subsequent treatment after the ProfScreen interview, and were thus verifiably in high need of professional treatment, the proportion of adolescents who had received appropriate care after one year was 10%. These low help-seeking rates are alarming, yet not unexpected. Previous research has repeatedly pointed to the significant gap between adolescents in need and those receiving professional care [11, 23, 31]. Possible barriers keeping adolescents in need from seeking professional help include a lack of perceived need, beliefs that treatment is not effective, mistrust of providers, or stigma [32]. These concerns associated with seeking professional help probably inhibited help-seeking behavior within the ProfScreen participants as well. The variety of individual barriers cannot be fully addressed by a school-based screening and must be targeted in particular interventions. If these barriers could be

successfully reduced, this might as well result in a higher effectiveness of school-based screenings regarding help-seeking rates.

Completing the ProfScreen intervention and receiving the recommendation of subsequent treatment was associated with increased utilization of professional care. Thus, school-based screenings, as implemented within the SEYLE school study, can help individual students to seek professional help, but only if they actively take advantage of the intervention offered. Although the use of professional help could be increased among the referred ProfScreen completers, the present findings are inconclusive regarding associations between ProfScreen referral and follow-up at-risk state. Overall, referred ProfScreen completers had a higher probability to be at-risk for mental health problems or risk-behaviour at follow-up. However, excluding countries with above missing data on this outcome, the associations became insignificant. Thus, at this point, it is unclear whether a brief screening intervention can have a positive effect on follow-up at-risk state, especially as the effect on actual help-seeking behaviour was small. Future studies might aim to improve participation in the follow-up assessments to receive valid data regarding effects on follow-up at-risk state. As students' younger age was associated with missing data on the at-risk state at follow-up, future studies should especially consider ways to improve adherence of younger adolescents.

However, although active participation of the ProfScreen intervention contributed to increased service use, assignment to the ProfScreen group per se could not promote help-seeking behavior compared to the control group. Only those who took advantage of the interview and received a subsequent treatment recommendation were able to benefit from the program. Within the present study, less than half of those presenting mental health problems or risk-behaviour followed the second part of the screening, the invitation for a clinical interview. As participation in the interview was crucial for improving follow up service use, this finding highlights a fundamental problem of school-based programs: how to motivate youth to make active use of the offer? Earlier SEYLE findings showed that more students attended the clinical interview if the waiting times were short and if the interview took place at their school,

as opposed to other locations [23]. Interventions that take place in schools, such as school-counselling, might additionally increase service use rates of young people. Future studies must take this into account when planning screening interventions by improving the second stage of the screening to increase interview attendance and subsequent service use rate.

Some characteristics of the investigated subsamples must be considered when interpreting the present findings. Compared to the control group, students of the ProfScreen group screened more often positive for suicidal tendencies and problems in social relationships at baseline. Further, an earlier SEYLE study reported that ProfScreen participants that attended the clinical interview and were referred to subsequent treatment had experienced a higher burden of mental health problems (i.e. more suicidal behaviour, tobacco use, depression, excessive media exposure, and very low BMI at baseline) compared to participants who were not referred to subsequent treatment [23]. A higher burden might have caused a higher treatment motivation of referred ProfScreen completers and could have influenced subsequent service use [23, 33]. On the other hand, students with current suicidality at baseline, experiencing the highest burden and thus a potentially increased treatment motivation, were excluded from the regular ProfScreen intervention. Although these participants were detected through the regular school-based screening, they were excluded from the usual ProfScreen procedure and received an immediate intervention, which was associated with increased follow-up service use [34]. Thus, a school-based screening might be able to increase actual help-seeking to a greater extinct than is shown by the present findings - always provided that the intervention offered is also taken up by the participants.

The ProfScreen intervention was part of the, to the best of our knowledge, first RCT aimed to improve young people's service use for mental health problems. Furthermore, it offers first findings on associations between ProfScreen referral and follow-up mental health problems and risk-behaviours. However, due to the self-selection of students regarding completion of the ProfScreen intervention, we are no longer able to report results of an RCT. The screening process, including the clinical interview, was standardised and performed according to the

study protocol in each country. Interview-settings and follow-up processes could, however, vary slightly due to different healthcare systems, and different barriers to care, that might be influenced by cultures. However, it is likely that our findings are applicable to a wide range of European countries, and other high-income countries, with similar cultural background. Lastly, we focussed only on the students' perspectives concerning service use. As their service use might depend on their parents, future studies could include both, the students' and the parents' perspectives.

Conclusion

The school-based screenings with clinical evaluation by professionals as implemented within the SEYLE study were positively associated with follow-up service use for young people at-risk for mental problems and risk-behaviours, but only if the students actively participated in the intervention offered. Assignment to the ProfScreen intervention group per se was not shown to have a positive effect on service use or at-risk status, and many participants did not take advantage of the follow-up support offered. Overall, the present study highlighted two major difficulties in school-based screenings: less than half of the sample accepted the invitation for a clinical interview, and subsequently, despite being referred, only few students engaged in professional treatment. Thus, prior to the implementation of large-scale school-based screening programs as a regular tool to address young people's mental health, further evidence and improvement of interview attendance rates as well as particular interventions targeting barriers to professional help are necessary.

Statements and Declarations

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Conflict of interest/Competing interests: On behalf of all authors, the corresponding author states that there is no conflict of interest.

Availability of data and material: The data that support the findings of this study are available from the corresponding author, MK, upon reasonable request.

Code availability: Not applicable.

Ethics approval: The study has been approved by the appropriate ethics committee of each study center and has therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Consent to participate and for publication: Written informed consent was obtained from all subjects and their legal guardians.

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Online Resources/ Supporting Information

Supplement to:

The Impact of School-Based Screening on Service Use in Adolescents At-Risk for Mental Health Problems and Risk-Behaviour

European Child & Adolescent Psychiatry

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Online Resource 1 Screening questions and guideline-based cut-off values for at-risk students

	Instrument used/assessed items	Cut-off value	Students of ProfScreen group were invited for interview if at least one of these cut-off values was reached:
Depression	20-items of the Beck's Depression Inventory (BDI-II) [1]	Sum score according to BDI manual	BDI-score ≥ 14
Anxiety	20-item Zung Self-Rated Anxiety Scale (SAS) [2]	Sum score according to Zung manual	Zung-score ≥ 45
Suicidal tendencies	Current suicidality with a modified version of the 4-item Paykel Suicide Scale (PSS) [3]	Item 1 answer option ≥ "very often"; Items 2-4 answer option ≥ "sometimes"	Cut-off for one of the four items is reached
	Have you ever tried to take your own life (y/n)?	Lifetime suicide attempt	"Yes" is given as an answer
Non-suicidal self-injury	Lifetime non-suicidal self-harm with the 6-item version of the Deliberate Self-Harm Inventory (DSHI) [4, 5]	Answer options were coded as following: 0 "never", 1 "1-2 times", 2 "3-4 times", 3 "5 times or more" The answers of questions 1-6 were summed up	sum-score ≥ 2
Eating behaviour	Body Mass Index (BMI)		BMI < 16.5
Risky behaviour (sensation seeking & delinquent behaviour)	Riding in a car with a driver that drunk alcohol (past 12 month)	1 "yes", 0 "no"	All answers were summed up, sum-score ≥ 3
	Riding skate board/roller skates in traffic or on streets without helmet (past 12 month)	1 "yes", 0 "no"	
	Riding between subway cars, holding on back of bus or other vehicles to pull you along (past 12 month)	1 "yes", 0 "no"	
	Going to places like certain streets, alleys or buildings where you know it is dangerous, such as at night or when others think something bad could happen (past 12 month)	1 "yes", 0 "no"	
	Sexual intercourse with how many people in lifetime	1 "number of people ≥ 4", 0 "number of people ≤ 3"	
	How often do you use condoms when having sexual intercourse?	1 "rarely" or "never", 0 "almost every time" or "always"	
Substance abuse	Tobacco consumption	≥2 cigarettes per day in Estonia, Germany, Hungary, Ireland, and	Reaching cut-off score for tobacco consumption

		Romania; ≥5 cigarettes per day in Italy and Slovenia; ≥7 cigarettes per day in France; and ≥10 cigarettes per day in Austria, Israel, and Spain	according to country of residence
	Alcohol consumption	(1) frequency: 2-3 times per week or more (2) amount: 3-4 drinks per drinking occasion or more (3) intoxication: getting 3 or more times drunk during lifetime (4) hangover: having 3 or more times a hangover after drinking during lifetime	Reaching cut-off scores for (1), (2), (3), or (4)
	Illegal drug consumption	Using drugs 3 or more times during lifetime	Reaching cut-off score for drug consumption
Exposure to media	How much time do you spend during a typical day watching television, playing computer games, or surfing the internet?	Being at least 5-6 hours per day exposed to media	Reaching cut-off score for media exposure
Social relationships	How often have you felt lonely during past 12 month?	Having felt lonely "most of the time" or "always"	Reaching cut-off score for social relationships
Bullying	15 items asking about peer victimisation in the past 12 month such as "being kicked by others", or "being teased by others", etc. were asked. Multiple answers possible	Bullying items that were answered with yes were summed up	≥ 5 incidents
School attendance	How many times did you miss school or class during past 2 weeks without permission?	At least 3 days in the past 2 weeks.	Raching cut-off score for school attendance

Assessed items for alcohol cut-off slightly differed between baseline and follow-up. The frequency of drinking (1) and the amount (2) were not considered in the follow-up. All students that were considered at-risk for mental problems or risk-behaviour because they fulfilled cut-off for frequency of drinking (1) or amount of drinking (2) also scored on other at-risk criteria. This means that after excluding these two items from the analysis, the at-risk population consisted of the same pupils. This let us conclude that these two items are not necessary to detect at-risk states for our purpose. Missing items at follow-up concerning regularity and amount of drinking will therefore not have an impact on follow-up at-risk state that are necessary for further analyses

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Supplement to:

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Online Resource 2 Missing data among students that completed follow-up 2 and were not emergency cases (reduced sample see Figure 1)

Total sample (N=4,931)	Missing (n)	Missing (%)
Sex	19	0.39
Age	28	0.57
Baseline screening parameters		
Depression	48	0.97
Anxiety	139	2.82
Suicidal tendencies	150	3.04
Non-suicidal self-injury	134	2.72
Eating behaviour	373	7.56
Risky behaviour[a]	75	1.52
Substance abuse	92	1.87
Exposure to media	90	1.83
Social relationships	27	0.55
Bullying	91	1.85
School attendance	33	0.67
At-risk at baseline	431	8.74
Interview attended	0	0
Referral to further treatment	0	0
Follow-up screening parameters		
Depression	53	1.07
Anxiety	186	3.77
Suicidal tendencies	23	0.47
Non-suicidal self-injury	142	2.88
Eating behaviour	354	7.18
Risky behaviour[a]	142	2.88
Substance abuse	88	1.78
Exposure to media	261	5.29
Social relationships	41	0.83
Bullying	146	2.96
School attendance	59	1.20
At-risk at follow-up	414	8.40
Follow-up service use	0	0

[a] Sensation seeking and delinquent behaviour

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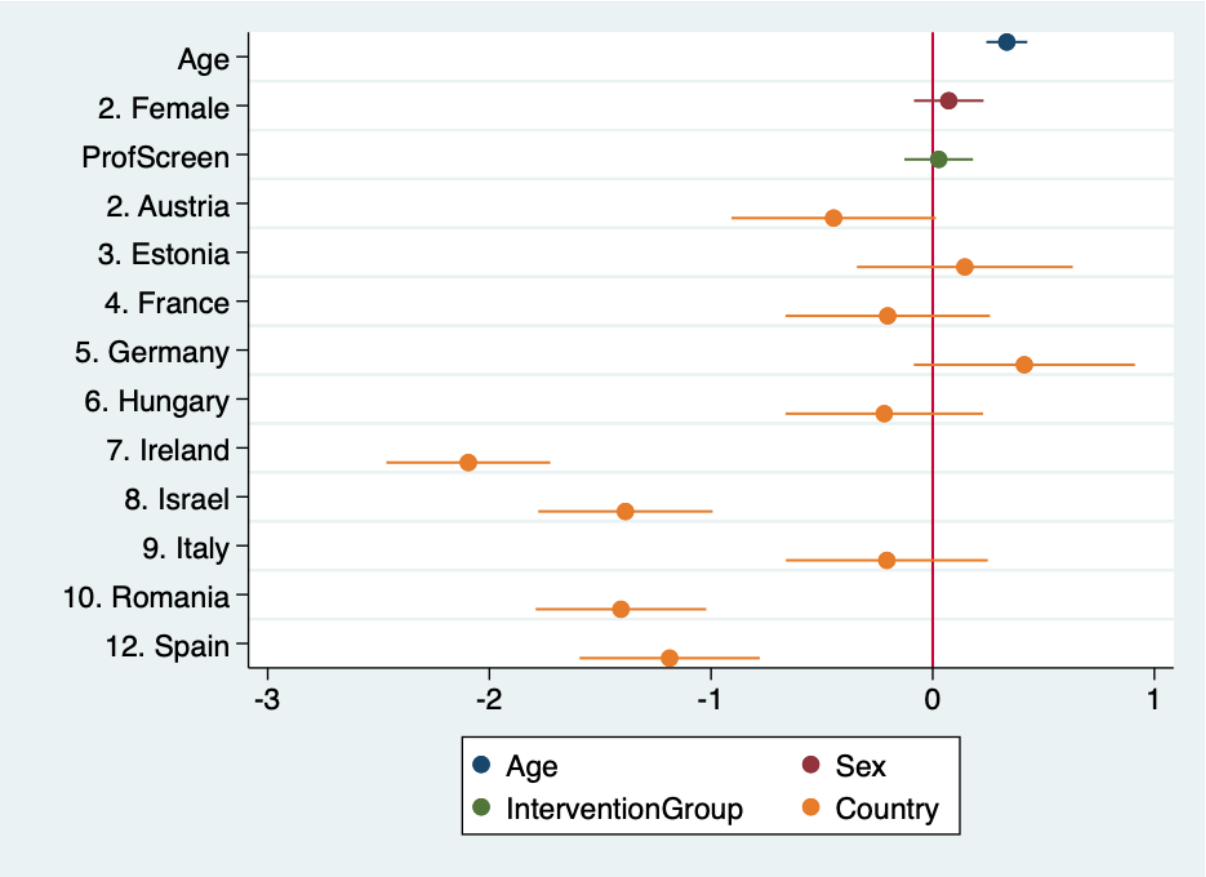

Online Resource 3 Pattern of missing data among students that completed follow-up 2, were not emergency cases and did not have missing age or sex

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Online Resource 4 Type of treatment that student sought within one year (n=2,583)

	Type of treatment					
	Medication	Prof one-to-one therapy	Group therapy	Advice from health prof	Non-prof treatment[a]	No treatment
Total sample, n(%)	23 (0.9)	46 (1.8)	8 (0.3)	16 (0.6)	30 (1.16)	2,460 (95.2)
Intervention group, n(%)						
ProfScreen	10 (0.8)	29 (2.2)	5 (0.4)	9 (0.7)	17 (1.3)	1,244 (94.7)
Control	13 (1.0)	17 (1.3)	3 (0.2)	7 (0.6)	13 (1.0)	1,216 (95.8)
Referral[b], n(%) *yes*	3 (2.0)	10 (6.7)	0 (0.0)	2 (1.3)	7 (4.7)	127 (85.2)

[a] includes 'mentor to talk to' and 'healthy lifestyle group'

[b] among screening completers

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Online Resource 5 Unadjusted logistic regressions of associations between ProfScreen intervention, referred ProfScreen completers, age, sex, and baseline screening parameters with service use after one year

	Service use after one year	
	OR	95%-CI
ProfScreen group[a]	1.291	0.850-1.961
Referral after ProfScreen[b]	**3.381**	1.894-6.035
Age[c]	1.098	0.871-1.385
Sex[d]	1.435	0.934-2.204
Baseline screening parameters[e]		
Depression	**2.513**	1.652-3.822
Anxiety	**2.516**	1.491-4.245
Suicidal tendencies	1.583	0. 995-2.521
Non-suicidal self-injury	**3.303**	2.150-5.075
Eating behaviour	0.924	0.397-2.146
Risky behaviour[f]	1.530	0.880-2.658
Substance abuse	1.062	0.696-1.621
Exposure to media	0.823	0.462-1.467
Social relationships	1.588	0.832-3.030
Bullying	**1.856**	1.103-3.122
School attendance	1.177	0.469-2.954

OR odds ratio, *CI* confidence interval, statistically significant results are displayed in **bold**

[a] Reference category: control group

[b] Reference category: not referred

[c] Reference: younger age

[d] Reference category: male

[e] Reference categories: cut-off for mental problems or risk-behaviours not met

[f] Sensation seeking and delinquent behaviour

Supplement to:

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Online Resource 6 Unadjusted logistic regression of association between ProfScreen intervention, referred ProfScreen completers, service use, age, and sex with follow-up at-risk state

	Follow-up at-risk state	
	OR	95% CI
ProfScreen group[a]	0.926	0.773-1.109
Referral after ProfScreen[b]	**1.692**	**1.083-2.645**
Service use[c]	**2.419**	**1.281-4.569**
Age[d]	1.074	0.970-1.189
Sex[e]	**0.687**	**0.571-0.827**

OR odds ratio, *CI* confidence interval, statistically significant results are displayed in **bold**

[a] Reference category: control group

[b] Reference category: not referred

[c] Reference category: no service use

[d] Reference: younger age

[e] Reference category: male

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Online Resource 7 Unadjusted and adjusted logistic regression of association between ProfScreen intervention, service use, age, and sex with follow-up at-risk state in subsample excluding countries with above average missing data on follow-up at-risk state (n=1,799)

	Follow-up at-risk state			
	unadjusted		adjusted	
	OR	95% CI	OR	95% CI
Referral after ProfScreen[a]	1.243	0.748-2.063	1.226	0.733-2.050
Service use[b]	**2.179**	1.025-4.630	**2.252**	1.053-4.815
Age[c]	0.993	0.873-1.129	0.989	0.868-1.126
Sex[d]	**0.641**	0.513-0.801	**0.630**	0.504-0.788

OR odds ratio, *CI* confidence interval, statistically significant results are displayed in **bold**

[a] Reference category: not referred

[b] Reference category: no service use

[c] Reference: younger age

[d] Reference category: male

Original publications: Manuscript 2

Promoting Help-seeking using E-technology for Adolescents with Mental Health Problems: Study Protocol for a Randomized Controlled Trial within the ProHEAD Consortium

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Abstract

Background

The highest incidence and prevalence of mental health problems across the lifespan as well as the first onset of most long-term mental health conditions is reported for youths between 14 and 25 years of age. At the same time, only 25% of adolescents with mental health problems receive professional treatment. One explanation for poor treatment access in youths is their low help-seeking behavior. Barriers that can keep children and adolescents (C&A) from seeking professional help include a lack of perceived need, structural barriers or stigma. Interventions based on E-technology might present an effective approach, overcoming these barriers by reducing stigma, providing low-threshold access with enhanced reach, ultimately facilitating help-seeking for mental health problems among youths.

Methods

The study is designed as a multi-center, randomized controlled trial. In total, an estimated number of *n* = 1,500 C&A with mental health problems, drawn from a school-based sample of *n* = 15,000 pupils attending school grades 6 to 13 (≥12 years of age), recruited in five regions of Germany, will be randomized either to an intervention (ProHEAD online) or control condition. C&A in the intervention group will receive online-access to tailored information and individual advice on where to seek professional help for their specific needs close to their place of living, case reports of and interaction with peers, as well as the opportunity for online and telephone counseling. C&A in the control intervention will receive a recommendation to seek help and online-information on where to find professional help. All participants will be asked to complete questionnaires concerning their help-seeking behavior at baseline, during the intervention (monitoring) as well as at a 1- and 2-year follow-up. The primary end-point is the number of C&A seeking conventional face-to-face professional help in the real-world setting within one year after their initial screening.

Discussion

The trial will investigate if an Internet-based intervention can increase professional help-seeking in C&A with mental health problems. With its randomized controlled design and large-scale school-based sampling, the study aims to overcome shortages of previous research. The intervention has the potential to narrow the treatment gap in C&A and to ultimately improve the mental health care system.

Trial registration

German Clinical Trials Register, DRKS00014685. Registered on 7 July, 2018.

Keywords

Help-seeking; mental health; internet; adolescents; randomized controlled trial; ProHEAD

Background

Children and adolescents (C&A) are frequently affected by psychiatric illness and mental health problems. Recent population-based studies report a 50% incidence of mental health problems in the age group between 12 and 25 years, and a 12-month prevalence of 40% for those between 13 and 18 years of age [1]. Mental health problems in this age group are associated with a high risk of persistence and serious functional impairment, emphasizing their long-term impact [2]. A recent review reported that neuropsychiatric disorders are the most common causes of disability (45%) in individuals between 10 to 24 years of age [3]. In sum, the highest incidence and prevalence of mental health problems across the lifespan and the first onset of most long-term mental health conditions is reported for youth between 14 and 25 years of age [4].

At the same time, and most alarmingly, youths clearly show the worst service access [4]. There is evidence that only 20–40% of adolescents with mental health problems are actually detected by health services and only 25% receive appropriate professional treatment [5]. This problem has been repeatedly confirmed for a variety of highly prevalent mental health problems such as depression [6], eating disorders [7], and substance misuse [8]. A representative study throughout Europe that included a school-based screening of *n* = 13,070 C&A (13-17 years of age) showed that at least 12.5% were in need of mental health care. However, less than one third took the offer of receiving direct professional help [9], illustrating very low help-seeking behavior among European adolescents at risk. These data fit those of previous studies concluding that C&A with mental health problems often do not receive treatment due to low help-seeking behavior [10, 11]. This is highly worrying, as the group of older C&A (aged 12-17) can be seen as the most important target group for early detection of individuals with mental health problems. Early detection increases the chance of early treatment, thus diminishing the risk of recurrence and/or serious residual damage, and thereby providing an opportunity to improve psychosocial outcomes and reduce health economic costs [12, 13].

Several barriers have been identified that potentially keep C&A from accessing mental health services [14]. A lack of perceived need for services, preference for self-management, fear of hospitalization, a lack of service availability within a reasonable time, lack of information, and structural factors (e.g., distance, finances) have been identified as key barriers to care [15]. Key components of C&A friendly services (according to the World Health Organization) are availability, easy accessibility, equitability (e.g., being non-judgmental; open for all young people regardless of gender, culture, marital status, socio-economic status, etc.), acceptability (e.g., having clear policies about confidential and patient-centered care), and appropriateness (e.g., staffed by skilled clinicians) [16].

By combining these features, interventions based on e-technology might present an effective approach to overcome barriers of help-seeking and to facilitate access to conventional care. Over the past decade, technology has played an increasing role in the delivery of psychosocial and psychotherapeutic interventions ("e-mental health"). E-mental health and Internet-based interventions have the advantage of easy, low-threshold access, enhanced reach, including traditionally underserved populations, relatively low cost and time efficiency. In addition, technology allows for providing flexible interventions that are tailored to the individual needs and preferences of participants. Across the spectrum of mental health problems, growing evidence points to the potential of e-interventions for the prevention, self-help treatment, counseling, and relapse prevention, and also as an adjunct to conventional psychotherapy using various forms of media and technology [17, 18]. It is assumed that Internet-based interventions may improve mental health literacy and contribute to a de-stigmatization of mental illness, thus promoting help-seeking attitudes, intentions and ultimately behaviors [19]. However, only a few studies attempted to utilize Internet-based interventions to promote mental help-seeking. A recent review identified 18 studies, all with major methodological limitations (i.e., small sample sizes, lack of control group, no follow-up, and failure to assess behavioral outcomes) [20]. Furthermore, existing Internet-based interventions mostly address one particular health condition (mainly depression or anxiety) rather than providing different modules for a broad range of mental health problems prevalent in C&A all integrated in one superordinate program. Promoting Help-seeking using E-technology for ADolescents (ProHEAD) is such a superordinate program, which covers mental health problems (i.e., conduct problems, hyperactivity/inattention, peer relationship problems, emotional problems, eating disorders, addiction, and suicidality) not jointly covered by other programs. Finally, previous research is limited by the fact that the interventions aiming to improve help-seeking have almost exclusively consisted of one-time, fully automated tools (mostly psychoeducational content), not giving consideration to the heterogeneous and complex pathways to care [15]. By specifically addressing these methodological issues, an intervention based on e-technology bears great potential to conquer various barriers of help-seeking in C&A, to facilitate service access, and to finally contribute to relieve the burden of mental disease in youths.

Objectives

The aim of the present study is to develop, implement, and evaluate an Internet-based program to promote help-seeking in C&A with mental health problems (i.e., scoring above critical thresholds in validated self-report questionnaires on diverse emotional and behavioral problems) across all disorders in a randomized controlled trial (RCT). The program will make

use of this age group's familiarity with the Internet to provide a low-threshold access to mental health assistance.

Hypotheses

The primary hypothesis is that a greater proportion of C&A with mental health problems who are randomized (intention-to-treat) to help-seeking assistance through an individualized online based intervention are more likely to actually utilize professional (formal) face-to-face mental health care from a child and adolescent psychiatrist or psychotherapist within 1 year (primary endpoint), compared to a control group receiving information only. Secondary hypotheses are that C&A allocated to the intervention group will score more favorably on measures of mental health problems, health-risk behaviors, and quality of life in the respective follow-up assessments, compared to the control group. Additionally, health economic analyses will be conducted to assess economic aspects of the newly developed intervention.

Methods/Design

Setting and recruitment

The trial is part of a multi-center consortium situated at six study sites across Germany and led by the managing site at the Clinic of Child and Adolescent Psychiatry at the University Hospital of Heidelberg (for details on the consortium, see the Editorial "*Promoting Help-seeking using E-Technology for ADolescents: The ProHEAD Consortium*"). The study protocol was approved by the Ethics Committee of the Medical Faculty at the University of Heidelberg.

A school-based sample of *n* = 15,000 C&A in grades 6 -13 (≥12 years of age) will be recruited at five regions in Germany (Hamburg, Heidelberg, Leipzig, Marburg, Schwäbisch Gmünd). Permission to contact schools within the regional districts of all five recruiting sites will be requested from federal authorities. A complete list of schools in regional districts will be acquired. Schools are randomly selected for each school type separately to ensure a random selection of schools that ultimately represents the distribution of school types within the recruitment area. The school list is stratified by regional district[1] and school-type[2]. Within these strata the order of schools is random. Regarding the intervention, individual-level

[1]Due to the regional specifics of the rural area around the recruitment site Schwäbisch Gmünd, a preselection was made. Only schools within a radius of 30 km were included.

[2]school types in Germany: *Gymnasium*, 8 or 9 years of school after 4 years of elementary school, terminating with the general qualification for university entrance; *Realschule*, 6 years of school after 4 years of elementary school, terminating with a secondary-school level certificate; *Hauptschule*, 9 years of elementary school, basis of vocational education; *Mittel-/Oberschule*: secondary school certificate; *Gemeinschaftsschule*/*Gesamtschule/Stadtteilschule* all qualifications are possible (qualification for vocational education, secondary school certificate and general qualification for university)

randomization is performed on all eligible participants to ensure timely allocation to one treatment arm. Schools of the mentioned school types will be contacted and informed about the possibility of participating in the trial in random order, until the prospected sample size by site is reached. Eligible C&A (≥12 years of age, sufficient German language skills, access to the Internet) and their legal guardians are asked to provide written informed consent and participate in a school-based screening covering various forms of mental health problems (detailed subsequently).[3] Study personnel will check back on the return of written informed consent sheets a couple of weeks after an informative class meeting and the distribution of study information materials. On the day of the assessment, C&A will further receive an emergency contact card, detailing procedures in the case of emergency or urgent request for professional consultation. School-based assessments will be repeated after 12 and 24 months.

Based on the screening results, each participant will be allocated to one of the five Internet-based trials (general mental health problems [this RCT]; eating disorder symptoms [21]; risky alcohol use [22]; depressive symptoms [23]; no mental health problems [24]). C&A meeting inclusion criteria for more than one RCT will be randomly allocated to one of the RCT. Criteria for the allocation of participants to the five individual ProHEAD RCTs are based on the latest scientific evidence from epidemiological studies. However, this is the first time that the overall algorithm is applied on a consortium-wide basis simultaneously screening for various mental health problems. Therefore, a preliminary data analysis will be conducted following completion of 10% of the screening assessments (n = 1,500) in order to determine the actual allocation ratio to the five ProHEAD trials and to adjust the screening algorithm if necessary.

Inclusion and exclusion criteria

C&A from the school-based sample (≥12 years of age, sufficient German language skills, access to the Internet) are included in the present clinical trial if they endorse any form of mental health problems, including serious suicide thoughts or attempts in the past 2 weeks, a score above 19 points on the Strengths and Difficulties Questionnaire [25] total score, or a score above the defined thresholds for one of its sub-scales: *emotional symptoms* (scores >6), *conduct problems* (scores >4), *hyperactivity/inattention* (scores >6), or *peer relationship problems* (scores >5). Further, C&A will be included if they report the following: body mass index (BMI) < 5th percentile (adjusted for age and gender) AND concurrent fear of weight gain OR daily binge eating OR daily vomiting OR current alcohol use disorder [26] OR a score above 9 on the Patient Health Questionnaire-9 modified for adolescents [27]. C&A scoring

[3]Note: The school-based ProHEAD screening covers a broad range of questionnaires and instruments. Detailed below are the ones most relevant to the present clinical trial. For further details on other instruments, please refer to the respective study protocols published alongside this protocol.

below all clinical cut-offs are allocated to other trials nested within the ProHEAD consortium. C&A not providing written informed consent (including parental consent) will be excluded.

Randomization and blinding

For the current trial, eligible C&A will be randomized to one of the two treatment arms based on a permuted block design (Fig. 1). Randomization will be automatically performed via a predefined algorithm after the school-based screening on an individual subject level to ensure timely allocation and allocation concealment. Participating C&A will receive an email with a link to activate their personal account in the allocated group. Participants cannot be blinded due to the different natures of the interventions. Blinding of the researchers is non-applicable. The data analysts will be blinded to group allocation (dummy coded) when conducting the statistical analyses.

Sample Size

Based on the expected sample size to be allocated by randomization (n = 1,500), a power analysis for the trial revealed that the study is powered to detect small effects (1.13 ratio, i.e., 13% differences in help-seeking between groups, alpha = 5%), assuming a critical $X^2 = 34.55$. All tests will be two-sided.

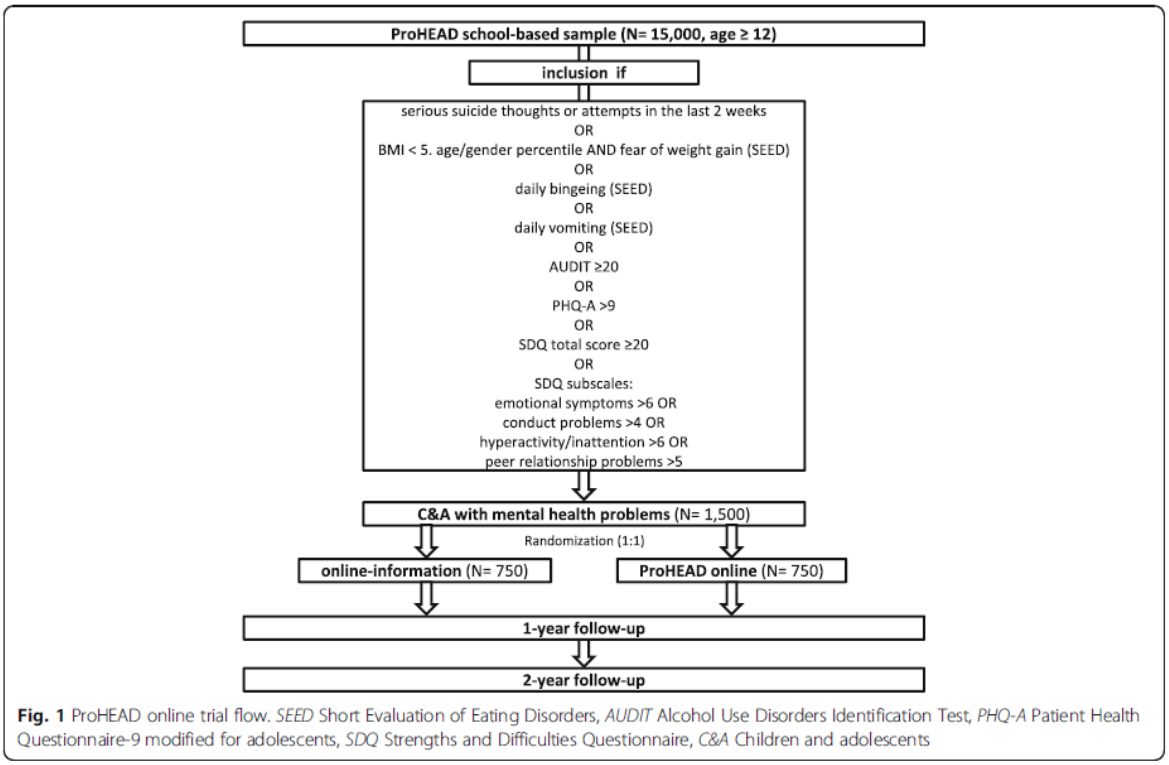

Fig. 1 ProHEAD online trial flow. *SEED* Short Evaluation of Eating Disorders, *AUDIT* Alcohol Use Disorders Identification Test, *PHQ-A* Patient Health Questionnaire-9 modified for adolescents, *SDQ* Strengths and Difficulties Questionnaire, *C&A* Children and adolescents

Data assessment

In addition to sociodemographic information (i.e., migration status, socioeconomic status), the school-based screening will cover screening instruments for a broad range of mental health problems. All measures have previously been used in adolescent samples [28–30]. Three self-report instruments will be used to cover help-seeking intentions, actual help-seeking behavior and attitudes toward help-seeking. The General Help-Seeking Questionnaire (GHSQ [28]) is a self-report measure of help-seeking intentions. Help-seeking intentions for selected mental health problems are assessed on an 8-point scale ranging from 1 (extremely unlikely) to 8 (extremely likely). The Actual Help-Seeking Questionnaire (AHSQ) [31] assesses actual help-seeking behavior by listing potential sources of help and measuring whether or not help has been sought from the respective sources within a specified time period (in the last 12 months; more than 12 months ago). It comprises three subscales: whether or not informal help has been sought, whether or not formal help has been sought, and whether no help has been sought. Further, the Inventory of Attitudes Toward Seeking Mental Health Services (IASMHS) [32] will be used. The IASMHS is a 24-item scale and has three internally consistent factors: *psychological openness*, *help-seeking propensity*, and *indifference to stigma*. To assess barriers of help-seeking, 12 items were generated based on a literature review of help-seeking barriers and compared with the validated instrument Barriers to Adolescents Seeking Help Scale (BASH-B [33]). Further, items from the Questionnaire on Social Distance [34], assessing stigma towards peers affected by mental health problems, will be implemented in the screening. Health care utilization of study subjects will be collected by the Mannheimer Modul Ressourcenverbrauch (MRV), a scale that lists all possible health care services for a given study sample or risk group and reports the frequency of usage (visits, drug intake, hospital days, etc.) over a given period of time [35]. Similar scales are applied in international cost studies [36]. The MRV was modified and pretested for its use in an adolescent population.

Figure 2 displays an overview of enrollment, interventions, and measures used as well as the corresponding time of assessment. In Additional file 1 a populated Standart Protocol Items: Recommendations for Intervention Trials (SPIRIT) checklist is provided. Additional file 2 provides the World Health Organization Trial Registration Data Set.

		STUDY PERIOD				
	Enrolment	Baseline	Allocation	Post-allocation (months)		
TIMEPOINT	t_0			*Monitoring*	*12*	*24*
ENROLMENT:						
Eligibility screen	X					
Informed consent	X					
Parent informed consent	X					
Allocation			X			
INTERVENTIONS:						
ProHEAD online				———	———	
Control condition				———	———	
ASSESSMENTS:						
Sociodemographic information		X				
AHSQ: *Actual Help Seeking Questionnaire*		X		X	X	X
GHSQ: *General Help-Seeking Questionnaire*		X				
Barriers of Help-seeking		X		X	X	X
IASMHS: *Inventory of Attitudes Towards Seeking Mental Health Services*		X			X	X
MRV: *Mannheimer Modul zum Ressourcenverbrauch*		X			X	X
KIDSCREEN-10: *Health-related quality of life measure for children and adolescents*		X			X	X
SDQ: *Strengths and Difficulties Questionnaire*		X			X	X
SITBI: *Self-Injurious Thoughts and Behaviour Interview*		X			X	X

Fig. 2 Schedule of enrollment, interventions, and assessments. *Note:* Monitoring 1: 7 days after registration, Monitoring 2–7: every 14 days for the following 10 weeks, Monitoring 8–14: every 28 days for the following 32 weeks, Monitoring 15: 301 days after registration

Participants receive no direct financial compensation for participating in the school-based assessments. Among all participating C&A, a lottery will be conducted, awarding online gift vouchers (20€ in value) to 5% of the participants.

Intervention

The intervention is individually delivered via the Internet. All C&A enrolled in this trial receive log-in information to an Internet-based platform that requires secured log-in. The web-based platform contains public content and a personal area with user-specific information and, depending on the group allocation, access to intervention modules. For participants in the control condition, the platform only contains information on the individual results of the school-based assessment and advice to seek professional counselling within the mental health care system. Moreover, the control group is granted access to addresses and names of local mental health care professionals and prompted by a static website encouraging them to seek help at the respective institutions. C&A in the control condition will only be contacted once and are not reminded or followed up outside of the school-based follow-up assessments. The design is justified by testing ProHEAD online against a real-world condition.

C&A allocated to ProHEAD online (intervention group) will receive their individual screening results, individual advice to seek professional help, and contact information for local mental health care professionals. Moreover, the intervention group is granted access to three additional modules: the *Information and Education Module*, the *Motivation and Guided Referral Module,* and the *Monitoring Module.*

Information and Education Module: C&A with mental health problems are provided with symptom- and gender-adequate information about mental health problems, personalized to their individual screening profile as assessed within the school-based screening. The module aims at providing tailored psychoeducation to affected C&A in order to reduce stigma associated with psychopathology and increase mental health literacy. Information on the causes and consequences of mental health problems as well as their prevalence and the possibilities for intervention are provided in a youth-adequate manner. Information was collected and summarized by staff with different occupational background in consensus with C&A experts in Germany as well as representatives from societies representing patients' interest. The information was reviewed by a specially invited focus group consisting of C&A between 12 and 14 years with mental health problems. To achieve a broad, comprehensive, and complete *Information and Education Module*, female and male C&A with different diagnoses were invited. These discussions lead to revisions of content that were ultimately implemented in the respective modules.

C&A can access information on all different forms and facets of mental health problems, but specific topics and chapters are highlighted based on their individual needs according to their screening profile in their personal area.

Motivation and Guided Referral Module: The *Motivation and Guided Referral Module* provides important transit between the *Information and Education Module* and actual referral to real-world services. ProHEAD online aims to motivate C&A with mental health problems to seek professional diagnostic assessments and potentially therapeutic help within the conventional face-to-face mental health care systems in manifold ways. Case examples from peers are provided to reduce stigma and prejudices about seeking and receiving help for mental health problems in order to promote a sense of community among C&A with mental health problems. Further, ProHEAD online offers case management, enabling C&A to chat with trained case managers at youth-adequate times (4 to 10 p.m.) through the ProHEAD online web portal, providing individual guidance and support. C&A are provided with addresses of local authorities and institutions and are offered advice in approaching mental health care services according to their individual needs and preferences. Case managers closely guide and counsel C&A on their way, requesting scheduled updates on individuals' progress and outcomes. The

case managers re-contact C&A via email within defined time frames of disengagement with the web-based platform, to improve binding and gain regular updates on their individual status.

Monitoring Module: A monitoring system allows for the gathering of information regarding the help-seeking behavior of C&A in the intervention group. This will enable the case managers to tailor the intervention to a participants' individual status, situation, and needs, allowing for adequate and tailored support of C&A. We distinguish automatized monitoring from individual monitoring. Automatized monitoring occurs based on user-website interaction in terms of 15 regular online assessments (Monitoring 1: 7 days after registration; Monitoring 2-7: every 14 days for the following 10 weeks; Monitoring 8-14: every 28 days for the following 32 weeks; Monitoring 15: 301 days after registration). As part of the automatized monitoring, C&A receive emails inviting them to complete a short questionnaire and motivating them to stay engaged with the platform. Automatized monitoring ends if C&A report successful help-seeking within the professional mental health care system. Alongside automated prompts, individual monitoring is realized via a team of case managers; each case manager tracks the progress of particular C&A. The case managers have different occupational backgrounds (e.g., psychologist, health education professional) and are trained in motivational interviewing [37] and all study specific procedures (i.e., administration of the program). Individual monitoring includes individual communication (chat, phone, and email) regarding the progress and status on a regular basis. After registration participants will have access for up to 10 months. The dose of the intervention is primarily determined by participating C&A. C&A are free to log in to the web-based platform according to their needs and interest. The system will send automated reminders to C&A that stay absent of the platform and have not made efforts to seek conventional face-to-face professional help.

Outcomes

The primary endpoint of the study is the 1-year follow-up, where all participants will be assessed on mental health problems and help-seeking intentions and behaviors, as well as actual help-seeking within the past year (primary outcome) in a second school-based assessment. A long-term follow-up will take place 2 years after the initial screening. C&A not participating at the school-based follow-up assessment will receive individual notices via email including a link to complete the assessment outside of the school environment if possible. All other medications and treatments used by participating C&A are permitted and will be assessed at the follow-up school-based screenings.

Statistical analysis

The main hypothesis is that a greater proportion of those C&A with mental health problems who are randomized to ProHEAD online (intention-to-treat) will present themselves within the

conventional professional mental health care system after 1 year compared to C&A in the control condition. This will be addressed using chi-squared tests with Fisher's exact *F* to adjust for zero inflation of cell distribution sizes (C&A who utilized professional help versus C&A who did not utilize professional help) on group differences. In secondary analyses, predictors of help-seeking behavior (i.e., sex, age, utilization of the online intervention, and symptom severity at initial school-based screening) will be assessed using multinomial logistic regression analyses. Engagement time per participant (minutes per day, days per month) and content of engagement will be tracked to get a reliable estimate of the utilization of the platform that is of interest for analyses of the dose-response relationship. Missing data and subjects withdrawn from the trial will be handled using an intention-to-treat approach. All subjects randomized will be considered in the analyses. In the case of drop-outs or missing data, it will be assumed that these C&A did not present themselves within the mental health care system to provide a conservative estimate of the true effect. Potential class and school effects will be tested and adjusted for if necessary.

In addition, cost-effectiveness analysis, including the calculation of the incremental cost-effectiveness ratio (ICER), will be conducted. To provide information on cost per quality-adjusted life years (QALY), cost-utility analyses will be used.

Data monitoring and safety

All data will be collected via central servers that are used for both the school-based assessments and the intervention conducted via the ProHEAD platform (www.prohead.de). All study data will be stored under a code, ensuring complete pseudonymization. Computerized assessments guarantee the highest level of data integrity and quality; i.e., missing data will be minimized, and false data entry will be prevented. Online access allows for continuous monitoring of data collection, documentation of access logs, and traceability of all entered data (user and timestamp) as well as restoration of all previous states. A Distributed Replicated Block Device (DRBD)-based cluster will provide synchronous replication of all data during data entry on two separate servers, as well as highest availability. In addition, full and incremental backups will be conducted following a predefined backup plan.

Data will be handled in accordance with German legal regulations concerning data protection and data security (Landesdatenschutzgesetz Baden-Württemberg and Bundesdaten-schutzgesetz) as well as European Union (EU) General Data Protection Regulation. Data storage and transfer will be encrypted. Access to the data will be strictly limited to authorized persons and password-protected. All servers are located at the University Hospital Heidelberg. Data will be stored for at least 10 years at the primary research institution. The data will be accessible for project partners and their respective statistical experts.

Monitoring will be done according to the Guideline for Good Clinical Practice (ICH-GCP). The Coordination Center for Clinical Trials (KKS) Heidelberg will oversee the study procedures at all five recruiting centers. In particular, the recruitment of schools and the students within these schools will be monitored in order to obtain adherence to the study manual and documentation guidelines and to ensure equivalent procedures at all sites.

An independent Data and Safety Monitoring Committee (DSMC) is formed by PD Dr. phil. Annette Conzelmann (University of Tübingen), Prof. Dr. rer. nat. Kerstin Konrad (University Hospital Aachen), and Prof. Dr. med. Susanne Walitza (University of Zurich). The DSMC will oversee all aspects of data collection, handling, and analysis.

Stopping rules

Stopping rules for C&A participating in the trial are the reporting of acute suicide plans or suicide attempts while participating in the ProHEAD intervention, as communicated with the case manager. In case of the reporting of acute suicide plans or attempts, special emergency procedures will be put in place that allow immediate contact with the participant in order to assess risks and refer to appropriate care. The case manager will try to get the participant to immediately seek help via an ambulance or the police. If no commitment can be achieved for voluntary help-seeking, the case managers will ascertain the first name and surname of the participant to report the plans to the local police. Further, C&A who withdraw consent to participate in the trial will discontinue participation. There are no discontinuation criteria for the whole trial.

Ethical issues

The study will be conducted in accordance to the declaration of Helsinki and the regulations for physicians of the medical association (Landesärztekammer) of Baden-Württemberg in their currently valid version. Study participation is voluntary. A participant can withdraw consent at any time without stating the reason and without any individual disadvantage for subsequent medical care. Study participants and their parents or alternatively persons with parental authority will be informed in writing about the procedures and potential undesirable effects or risks of the study. Their approval will be documented via their signature on the informed consent forms. The Ethics Committee of the Medical Faculty at the University of Heidelberg will be informed in case of severe adverse events and other unintended effects of the trial interventions.

Dissemination of results

In addition to research publications and conference contributions, the ProHEAD Consortium will take several measures to disseminate the results beyond the scientific community. Information about the project and on the availability of the Internet-based interventions and e-mental health tools (after-study stage) will be provided to patients and health care providers as well as to youth organizations and schools. Awareness in the general public will be increased by the ProHEAD website (www.prohead.de) and press campaigns accompanying the development of the project, disseminating its results.

Discussion

The aim of the trial is to investigate if an Internet-based intervention can increase help-seeking behavior in C&A with mental health problems. Existing empirical research suggests that e-interventions are indeed capable to promote help-seeking behavior in youths [38, 39]. Most C&A prefer technology-based interventions over a face-to-face in-person contact [40]. Internet-based mental health services offer anonymous help in an unobtrusive but easily accessible way that is modern and age-appropriate. In this manner, C&A in need can be reached, who otherwise would not find their way into the health care system, e.g., because of stigma, fear, or structural reasons. However, some interventions based on e-technology previously implemented failed to help participants to ask for professional help [41, 42]. A systematic review analyzed 18 studies investigating the effects of e-interventions on young people's help-seeking and identified a number of shortcomings in existing studies [20]. According to this review, some trials showed no methodological rigor (e.g., a lack of control group, no follow-up assessments) or included participants with mild mental health problems only. Furthermore, the majority of programs placed an emphasis on information only, did not include interactive modules, and were evaluated in small community-based samples. Using a randomized controlled design on a large-scale sample, the present study aims to overcome these shortcomings. The intervention is suitable for a broad range of C&A affected by different mental health problems with clinical relevance. At the same time, a unique strength of the intervention is the individual mentoring, enabling customized support for each participant. Cooperation with consortium partners all over Germany allows for the recruitment of a representative sample of n = 15,000 C&A, of which n = 1,500 (10%) are expected to fulfill eligibility criteria for the present trial. The consortium members have long-standing experience in school-based recruitment and mental health assessment of C&A [43-45]. The school-based screening reaches all C&A without self-selection bias and enables for an intention-to-treat approach.

Despite the significant advantages of a large scale multi-center study, running a trial in different study centers comes with special demands. There is a risk that single study sites may perform differently in recruitment, placing a requirement for special attention on standardized study implementation. For this purpose, a special training for recruiting staff from all study sites will take place prior to the baseline screening to ensure strict adherence to the study manual. Standardized information material further supports comparable results and reduces study site-specific biases. Participation in the study does not present any obvious risks for C&A. All participants, including those in the control condition, will receive information on where to seek help for mental health problems.

Implications and future impact

Young people are familiar with the Internet and online programs. They can access them at any time in accordance with their individual needs. Therefore, an online intervention might be the superior way to provide tailored information and low-threshold access to enhance help-seeking for mental health problems among youths.

Especially in this population, interventions are needed, because early detection increases the chance of early treatment. This diminishes the risk of recurrence and/or serious residual damage, thereby providing an opportunity to improve psychosocial outcomes and reduce health-economic costs [12, 13].

If the intervention is shown to be effective, the present study has the potential to narrow the treatment gap in C&A and to ultimately improve the mental health care system.

Trial status

The recruitment of the school-based sample within the ProHEAD consortium will start in October 2018 with the baseline assessment and last until March 2020.

Additional files

Additional file 1: SPIRIT 2013 Checklist: recommended items to address in a clinical trial protocol and related documents

Additional file 2: World Health Organization Trial Registration Data Set

List of abbreviations

AHSQ	Actual Help-Seeking Questionnaire
AUDIT	Alcohol Use Disorders Identification Test

BASH-B	Barriers to Adolescents Seeking Help Scale
C&A	Children and adolescents
DSMB	Data and Safety Monitoring Committee
GHSQ	General Help-Seeking Questionnaire
IASMHS	Inventory of Attitudes Toward Seeking Mental Health Services
ICH-GCP	Guideline for Good Clinical Practice
KIDSCREEN	Health-related quality of life measure for children and adolescents
KKS	Koordinierungszentrum für Klinische Studien
MRV	Mannheimer Modul Ressourcenverbrauch
PHQ-A	Patient Health Questionnaire-9 modified for adolescents
ProHEAD	Promoting Help-Seeking using E-technology for Adolescents
RCT	Randomized Controlled Trial
SDQ	Strengths and Difficulties Questionnaire
SEED	Short Evaluation of Eating Disorder
SITBI	Self-Injurious Thoughts and Behaviour Interview

Ethics approval and consent to participate

The study was approved by the Ethics Committee of the Medical Faculty at the University of Heidelberg (S-086/2018; leading study site). Subsequently, ethical approval is sought at all other study sites recruiting participants (Hamburg, Leipzig, Marburg, Schwäbisch Gmünd). In order to participate in the study, all C&A are required to provide written informed consent of themselves and their parents/caregivers/legal substitute.

Consent for publication Not applicable

Availability of data and material Data sharing is not applicable to this article as no datasets were generated or analyzed yet.

Competing interests The authors declare that they have no competing interests.

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Authors' contributions

MK and JK had the idea for the study and obtained funding. MK is the principal investigator of the trial and the coordinator of the ProHEAD consortium. SB is the co-coordinator of the

ProHEAD consortium. JK was critically involved as Co-PI in the planning and the conduct of the study. SR and SL are the scientific staff for the trial and are critically involved in the realization of the study. SR oversees the coordination of the study. MK, JK, SR and SL wrote the first draft of this study protocol. MK, KB, HE, CRK and RT are the site leaders of the five recruiting centers; SB and MM are responsible for technological support; HJS is responsible for health economic analysis. All authors revised the manuscript for important intellectual content and approved the final version of the manuscript.

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Additional Files

Additional File 1 SPIRIT 2013 Checklist: Recommended items to address in a clinical trial protocol and related documents*

Section/item	Item No	Description	Addressed on page number
Administrative information			
Title	1	Descriptive title identifying the study design, population, interventions, and, if applicable, trial acronym	1
Trial registration	2a	Trial identifier and registry name. If not yet registered, name of intended registry	4
	2b	All items from the World Health Organization Trial Registration Data Set	Additional file 2; Table 1
Protocol version	3	Date and version identifier	_____
Funding	4	Sources and types of financial, material, and other support	23
Roles and responsibilities	5a	Names, affiliations, and roles of protocol contributors	1, 24
	5b	Name and contact information for the trial sponsor	1

	5c	Role of study sponsor and funders, if any, in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication, including whether they will have ultimate authority over any of these activities	24, 25
	5d	Composition, roles, and responsibilities of the coordinating centre, steering committee, endpoint adjudication committee, data management team, and other individuals or groups overseeing the trial, if applicable (see Item 21a for data monitoring committee)	18
Introduction			
Background and rationale	6a	Description of research question and justification for undertaking the trial, including summary of relevant studies (published and unpublished) examining benefits and harms for each intervention	5-7
	6b	Explanation for choice of comparators	13
Objectives	7	Specific objectives or hypotheses	7, 8
Trial design	8	Description of trial design including type of trial (eg, parallel group, crossover, factorial, single group), allocation ratio, and framework (eg, superiority, equivalence, noninferiority, exploratory)	8-10

Methods: Participants, interventions, and outcomes

Study setting	9	Description of study settings (eg, community clinic, academic hospital) and list of countries where data will be collected. Reference to where list of study sites can be obtained	8, 9
Eligibility criteria	10	Inclusion and exclusion criteria for participants. If applicable, eligibility criteria for study centres and individuals who will perform the interventions (eg, surgeons, psychotherapists)	10
Interventions	11a	Interventions for each group with sufficient detail to allow replication, including how and when they will be administered	13-16
	11b	Criteria for discontinuing or modifying allocated interventions for a given trial participant (eg, drug dose change in response to harms, participant request, or improving/worsening disease)	18, 19
	11c	Strategies to improve adherence to intervention protocols, and any procedures for monitoring adherence (eg, drug tablet return, laboratory tests)	15, 16
	11d	Relevant concomitant care and interventions that are permitted or prohibited during the trial	16
Outcomes	12	Primary, secondary, and other outcomes, including the specific measurement variable (eg, systolic blood pressure), analysis metric (eg, change from baseline, final value, time to event), method of aggregation (eg, median, proportion), and time point for each outcome. Explanation of the clinical relevance of chosen efficacy and harm outcomes is strongly recommended	11, 12, 16

Participant timeline	13	Time schedule of enrolment, interventions (including any run-ins and washouts), assessments, and visits for participants. A schematic diagram is highly recommended (see Figure)	13
Sample size	14	Estimated number of participants needed to achieve study objectives and how it was determined, including clinical and statistical assumptions supporting any sample size calculations	11
Recruitment	15	Strategies for achieving adequate participant enrolment to reach target sample size	9

Methods: Assignment of interventions (for controlled trials)

Allocation:

Sequence generation	16a	Method of generating the allocation sequence (eg, computer-generated random numbers), and list of any factors for stratification. To reduce predictability of a random sequence, details of any planned restriction (eg, blocking) should be provided in a separate document that is unavailable to those who enrol participants or assign interventions	11
Allocation concealment mechanism	16b	Mechanism of implementing the allocation sequence (eg, central telephone; sequentially numbered, opaque, sealed envelopes), describing any steps to conceal the sequence until interventions are assigned	11
Implementation	16c	Who will generate the allocation sequence, who will enrol participants, and who will assign participants to interventions	11

Blinding (masking)	17a	Who will be blinded after assignment to interventions (eg, trial participants, care providers, outcome assessors, data analysts), and how	11
	17b	If blinded, circumstances under which unblinding is permissible, and procedure for revealing a participant's allocated intervention during the trial	_____

Methods: Data collection, management, and analysis

Data collection methods	18a	Plans for assessment and collection of outcome, baseline, and other trial data, including any related processes to promote data quality (eg, duplicate measurements, training of assessors) and a description of study instruments (eg, questionnaires, laboratory tests) along with their reliability and validity, if known. Reference to where data collection forms can be found, if not in the protocol	11, 12, 18
	18b	Plans to promote participant retention and complete follow-up, including list of any outcome data to be collected for participants who discontinue or deviate from intervention protocols	16
Data management	19	Plans for data entry, coding, security, and storage, including any related processes to promote data quality (eg, double data entry; range checks for data values). Reference to where details of data management procedures can be found, if not in the protocol	17, 18
Statistical methods	20a	Statistical methods for analysing primary and secondary outcomes. Reference to where other details of the statistical analysis plan can be found, if not in the protocol	16, 17
	20b	Methods for any additional analyses (eg, subgroup and adjusted analyses)	17

	20c	Definition of analysis population relating to protocol non-adherence (eg, as randomised analysis), and any statistical methods to handle missing data (eg, multiple imputation)	17
Methods: Monitoring			
Data monitoring	21a	Composition of data monitoring committee (DMC); summary of its role and reporting structure; statement of whether it is independent from the sponsor and competing interests; and reference to where further details about its charter can be found, if not in the protocol. Alternatively, an explanation of why a DMC is not needed	18
	21b	Description of any interim analyses and stopping guidelines, including who will have access to these interim results and make the final decision to terminate the trial	18, 19
Harms	22	Plans for collecting, assessing, reporting, and managing solicited and spontaneously reported adverse events and other unintended effects of trial interventions or trial conduct	18, 19
Auditing	23	Frequency and procedures for auditing trial conduct, if any, and whether the process will be independent from investigators and the sponsor	18
Ethics and dissemination			
Research ethics approval	24	Plans for seeking research ethics committee/institutional review board (REC/IRB) approval	8

Protocol amendments	25	Plans for communicating important protocol modifications (eg, changes to eligibility criteria, outcomes, analyses) to relevant parties (eg, investigators, REC/IRBs, trial participants, trial registries, journals, regulators)	19
Consent or assent	26a	Who will obtain informed consent or assent from potential trial participants or authorised surrogates, and how (see Item 32)	9
	26b	Additional consent provisions for collection and use of participant data and biological specimens in ancillary studies, if applicable	n.a.
Confidentiality	27	How personal information about potential and enrolled participants will be collected, shared, and maintained in order to protect confidentiality before, during, and after the trial	17, 18
Declaration of interests	28	Financial and other competing interests for principal investigators for the overall trial and each study site	23
Access to data	29	Statement of who will have access to the final trial dataset, and disclosure of contractual agreements that limit such access for investigators	18
Ancillary and post-trial care	30	Provisions, if any, for ancillary and post-trial care, and for compensation to those who suffer harm from trial participation	n.a.
Dissemination policy	31a	Plans for investigators and sponsor to communicate trial results to participants, healthcare professionals, the public, and other relevant groups (eg, via publication, reporting in results databases, or other data sharing arrangements), including any publication restrictions	19
	31b	Authorship eligibility guidelines and any intended use of professional writers	_____

	31c	Plans, if any, for granting public access to the full protocol, participant-level dataset, and statistical code	_____
Appendices			
Informed consent materials	32	Model consent form and other related documentation given to participants and authorised surrogates	_____
Biological specimens	33	Plans for collection, laboratory evaluation, and storage of biological specimens for genetic or molecular analysis in the current trial and for future use in ancillary studies, if applicable	n.a.

*It is strongly recommended that this checklist be read in conjunction with the SPIRIT 2013 Explanation & Elaboration for important clarification on the items. Amendments to the protocol should be tracked and dated. The SPIRIT checklist is copyrighted by the SPIRIT Group under the Creative Commons "Attribution-NonCommercial-NoDerivs 3.0 Unported" license

Additional File 2 World Health Organization Trial Registration Data Set

Data category	Information
Primary Registry and Trial Identifying Number	German Clinical Trials Register (DRKS), DRKS00014685
Date of Registration in Primary Registry	
Source(s) of Monetary or Material Support	Federal Ministry of Education and Research (BMBF)
Primary Sponsor	Clinic of Child and Adolescent Psychiatry, Centre of Psychosocial Medicine, University of Heidelberg, Blumenstrasse 8, Heidelberg 69115, Germany
Contact for Public Queries	Prof. Dr. med. Michael Kaess; Michael.Kaess@med.uni-heidelberg.de
Contact for Scientific Queries	Prof. Dr. med. Michael Kaess; Michael.Kaess@med.uni-heidelberg.de
Public Title	Promoting Help-seeking using E-technology for Adolescents with Mental Health Problems: Study Protocol for a Randomized Controlled Trial within the ProHEAD Consortium
Scientific Title	Promoting Help-seeking using E-technology for Adolescents with Mental Health Problems: Study Protocol for a Randomized Controlled Trial within the ProHEAD Consortium
Countries of Recruitment	Germany
Health Condition(s) or Problem(s) Studied	Mental Health problems
Intervention(s)	Internet-based intervention to promote help-seeking in adolescents with mental health problems
Key Inclusion and Exclusion Criteria	Children and adolescents (C&A) in grades 6-13 (≥12 years of age) are included if they endorse any form of mental health problems, including: serious suicide thoughts or attempts in the past two weeks, a score above 19 points on the *Strengths and Difficulties Questionnaire* total score, or a score above the defined thresholds for one of its sub-scales: emotional symptoms (scores >6), conduct problems (scores >4), or hyperactivity/inattention (scores >6). Further, C&A will be included if they report the following: Body Mass Index (BMI) < 5th percentile (adjusted for age and gender) AND concurrent fear of weight gain OR daily binge eating OR daily vomiting OR current alcohol use disorder (*AUDIT*) OR a score above 9 on the *Patient Health Questionnaire-9*.
Study Type	Randomized, multi-center, active control group, parallel group design
Date of First Enrollment	01.11.2018
Sample Size	1,500
Recruitment Status	Recruitment planned
Primary Outcome(s)	Actual help-seeking in the mental healthcare system at the time of the one-year follow-up
Key Secondary Outcomes	Frequency of contacts to professional mental health care system, long-term symptom development
Ethics Review	Approved by the Ethics Committee of the Medical Faculty at the University of Heidelberg (S-086/2018)

BMBF Bundesministerium für Bildung und Forschung [Federal Ministry of Education and Research]; *DRKS* Deutsches Register Klinischer Studien [German Clinical Trials Register

Original publications: Manuscript 3

Note: This manuscript is currently under review at *Early Intervention in Psychiatry*. The version presented here is as of January 2022.

Impact of COVID-19 related Lock-Down Measures on Help-Seeking Attitudes and Help-Seeking Behavior for Mental Health Problems in Adolescents

Short running title: COVID-19 and Help-Seeking in Adolescents

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Abstract

Aim: Comparing measures of psychological wellbeing and help-seeking in youths before and within the coronavirus disease 2019 (COVID-19) pandemic enables a better understanding of the effects the pandemic has for those seeking professional help for mental health problems.

Methods: Data were obtained from the Germany-based ProHEAD school study. Pre- and post-lockdown samples (n=648) were compared regarding pupils' psychological wellbeing, help-seeking attitudes and help-seeking behavior.

Results: Participants from the post-lockdown sample showed greater positive attitudes towards seeking professional help, whereas psychological wellbeing and help-seeking behavior remained stable.

Conclusions: The finding highlights the importance of a constant public discourse about mental health.

Keywords: Adolescents; COVID-19; Help-Seeking Attitudes; Help-Seeking Behavior; Mental Health

Clinical Trials Registration: The trial is registered in the German Clinical Trials Register, DRKS00014685. Registered on 7 July, 2018.

1. Introduction

The coronavirus disease 2019 (COVID-19) pandemic with its associated school closings and physical distancing requirements starting in spring 2020 placed a particular challenge for the mental health of children and adolescents (Racine et al., 2020). At the same time, access to health care services such as psychotherapy or outpatient psychiatric treatment was restricted, posing additional barriers to professional care, which is already under-utilized by young people in need (Sanci, Lewis, & Patton, 2010). Thus, one could assume that the lockdown increased the need for professional mental health care in youths, whereas utilization was lower than before. The ongoing ProHEAD (Promoting Help-seeking using E-Technology for Adolescents) project allows for a comparison of the mental health status as well as help-seeking behaviors and attitudes of children and adolescents in Germany before vs. within the nation-wide school closings that were implemented in Germany on March 16th 2020.

2. Methods

ProHEAD is a multi-center consortium situated at six study sites across Germany and led by the managing site at the Department of Child and Adolescent Psychiatry at the University Hospital Heidelberg (Kaess & Bauer, 2019). Ethical approval had been obtained by the lead Ethics Committee of the Medical Faculty at the University of Heidelberg (Study ID: S-086/2018) and subsequently at all involved study sites. Participation in the ProHEAD project comprises a detailed, usually school-based, screening that includes measurements of mental health problems (Strengths and Difficulties Questionnaire; Goodman, 1997), help-seeking behavior (Actual Help-Seeking Questionnaire, AHSQ; Rickwood & Braithwaite, 1994) and help-seeking attitudes (Inventory of Attitudes towards Seeking Mental Health Services questionnaire, IASMHS; Mackenzie, Knox, Gekoski, & Macaulay, 2004).

Due to the nation-wide school-closings in Germany from March 16th, the school-based screenings were paused and pupils who had provided written informed consent from themselves and their legal guardians were invited for online participation, i.e. they completed the baseline screening at home after an Email invitation. A total of n = 5,408 participants (≥ 12

years of age) who were recruited in five regions of Germany and attend school grades 6 to 13 had completed the ProHEAD baseline screening at the time of analyses. Of those, n = 324 participants completed the questionnaire between March 16th and August 31st 2020 ("post-lockdown sample"). Within this time, most pupils were taught via home-schooling and all participants experienced extensive constraints to their usual daily lives by physical distancing regulations and other containment efforts. From the children and adolescents who were screened before March 16th ("pre-lockdown sample"), n = 324 participants were individually selected as a comparison group by matching participants for age, sex and school-type. In total, a sample of n = 648 C&A (50% each pre- and post-lockdown, 68% female, *M* = 14.93 years, *SD* = 1.88) arose for this analysis. Group differences in help-seeking and wellbeing between the pre- and post-lockdown samples were analyzed using two-sample t-tests. Further, changepoint analyses (Eckley, Fearnhead, & Killick, 2011) implemented in R using the "changepoint" package (Killick & Eckley, 2014) were used to explore patterns of changes in help-seeking over time. Changepoint analyses estimate points at which the statistical properties of an observation change and contribute meaningfully to differences in test statistics between adjacent segments. Thus, this method can be used to detect separate homogenous segments in time series data (Eckley et al., 2011; Killick & Eckley, 2014). Here we defined a minimum length of n = 50 consecutive observations to constitute one segment for analyses.

3. Results

Analyses revealed that participants completing the baseline screening after March 16th (post-lockdown) reported statistically significantly more positive attitudes towards seeking help for mental health problems (*M* = 74.10, *SD* = 10.45), when compared to participants pre-lockdown (regular school-based screening) (*M* = 71.80, *SD* = 10.02, $t_{(648)}$ = 2.87, *p* = .004, *d* = .224). Changepoint analysis was conducted for the IASMHS measure. The changepoint plot is shown in *Figure 1*.

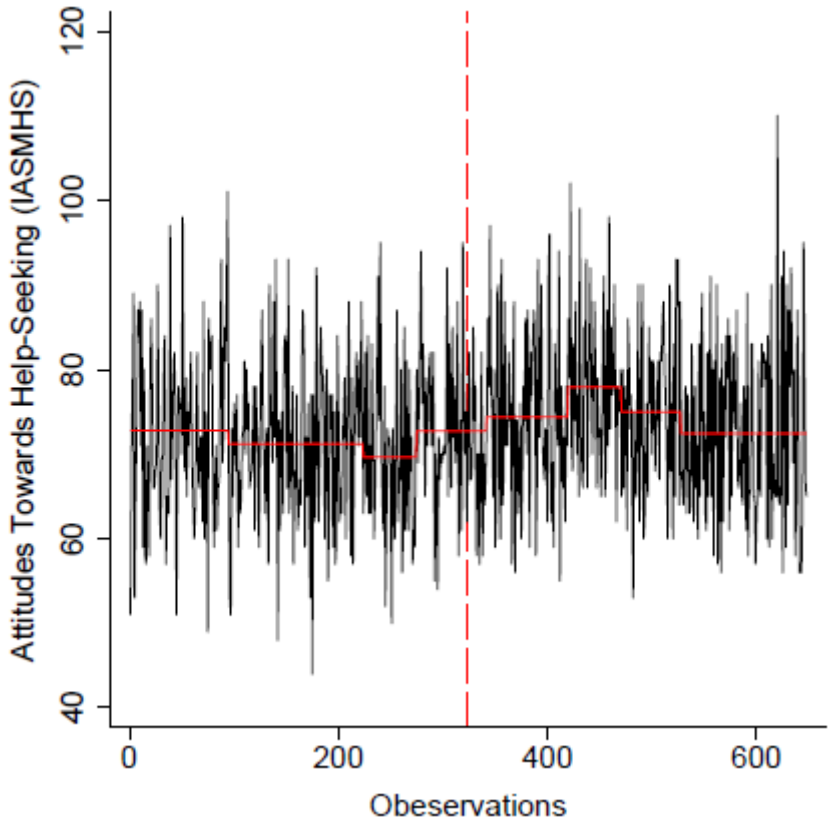

Figure 1. Changepoint analysis of the IASMHS scores from first to last included participant (N = 648)

A subsequent post-hoc linear regression analysis revealed no significant interactions, indicating that mental health problems (SDQ) had no effect on the observed increase. There were no differences between the pre- and post-lockdown samples regarding actual help-seeking (AHSQ) or mental health problems (SDQ), nor were there any significant interactions with time of participation when tested in linear regressions.

4. Discussion

The more positive attitudes towards seeking professional help for a mental health problem in participants from the post-lockdown sample might reflect an intensified public debate about mental health in the course of the COVID-19 pandemic. Despite the absence of scientific evidence, there are various examples for mass media articles addressing this topic (Harvard Pilgrim Health Care, 2020; International Red Cross and Red Crescent Movement, 2020; World

Health Organization, 2020). Openly discussing the possible negative effects of social distancing and other containment efforts on the psychological wellbeing might have the potential to raise awareness, might reduce stigmatizing attitudes, and might improve readiness to seek professional help when needed. Figure 1 shows that the increased attitude values declined after some time and reached the pre-lockdown level when the last participants were included in August 2020. By this time, most schools had returned to face-to-face teaching, also during summer the media coverage of the pandemic and its consequences decreased (Pearman et al., 2021). Possibly, as the public discourse faded, young people lost their attained awareness for the topic. However, at this point, associations between the COVID-19 media coverage and changes in adolescent help-seeking attitudes can only be of speculative nature, and further scientific evidence is needed to confirm underlying causal relationships. The temporary increase in positive attitudes towards help-seeking did not result in higher rates of actual help-seeking though. This might be explained by the impeded access to health care services within the pandemic, hampering children and adolescents from seeking actual face-to-face help. Instead, those in need turned to online services, as demonstrated by an increased utilization of the ProHEAD-online intervention (Kaess et al., 2020). Online interventions for children and adolescents with severe mental health problems, like implemented in line with the ProHEAD project, presumably could compensate for some of the ceased face-to-face contact points of professional help.

The extent of mental health problems was not influenced by the lockdown in the present matched samples; neither did these variables moderate any effects of the lockdown on help-seeking. Thus, regardless of their mental health status, participants in the post-lockdown sample did not have an increased need for treatment compared to those from the pre-lockdown sample. Although other studies reported increased loneliness and mental health deterioration in young people during the lockdown (Racine et al., 2020), pupils in the present sample did not show increased mental-health problems in response to the pandemic. While it is well plausible that adolescents with increased mental-health problems refrained from participation in the study, thus introducing sampling bias, experiences with ProHEAD are different. Importantly,

ProHEAD provides online support for adolescents with mental health problems and accordingly previous utilization rates within the group of adolescents in need were high in the past and increased during the pandemic (Kaess et al., 2020), indicating that in fact adolescents in need participated in the study. However, it is still possible that this pattern changed during the pandemic and those wo experienced declines in their mental health during this time did decide to not participate in the study. Nevertheless, the present finding should encourage to question premature conclusions regarding the mental health status of children and adolescents during COVID-19, especially as most of the previous studies, unlike the presented data from the ProHEAD project, lacked comparative pre-lockdown samples (Racine et al., 2020). It must be noted that the effect size for the difference in help-seeking attitudes between pre- and post-lockdown sample was small (d = .224). However, as the observed effect was not due to a specific intervention targeting at help-seeking outcomes but became evident as a part of general political measures, even a small effect should be recognized and discussed.

Overall, the findings highlight the importance of a public debate about mental health and mental health treatment, which may ultimately help to reduce stigma, increase the utilization of professional care and finally the wellbeing of children and adolescents. This will require a constant dialogue on the issue, not only within the pandemic but the aftermath, as observed positive effects seem to cease when there is no long-term attention on the subject.

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Conflict of interest: All authors confirm that there is no potential, perceived, or real conflict of interest.

Data availability: The data that support the findings of this study are available from the corresponding author, MK, upon reasonable request.

Ethics approval: The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving human subjects/patients were approved by the Ethics Committee of the Medical

Faculty at the University of Heidelberg (S-086/2018; leading study site) and all other study sites recruiting participants (Hamburg, Leipzig, Marburg, Schwäbisch Gmünd).

Consent to participate: Written informed consent was obtained from all subjects and their legal guardians.

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Help-seeking Duration in Adolescents with Suicidal Behavior and Non-Suicidal Self-Injury

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Abstract

Prompt access to appropriate professional care for adolescents with self-harm thoughts and respective behaviors (suicidal behavior and non-suicidal self-injury [NSSI]) is crucial as both are associated with an increased risk of suicide in later life. The present study aimed to describe the duration from initial onset of thoughts and incidents of self-harm until first clinical presentation in children and adolescents and to identify factors affecting help-seeking duration. Onset of self-harm thoughts and behaviors, time of first clinical presentation, and psychiatric and demographic variables were obtained from n = 672 adolescents (11-19 years) from the Germany-based AtR!Sk (*Ambulanz für Risikoverhalten & Selbstschädigung*) cohort-study at an outpatient clinic for risk-taking and self-harm behaviors. In 22% of overall cases, the first self-harm thoughts and behaviors occurred after contact to professional care was already established. Focusing on actual help-seeking delay only, it took between *M* = 0.99 years (after first suicide attempt) and *M* = 1.98 years (after first thoughts of NSSI) until participants sought professional help. Overall, help-seeking duration and help-seeking delay were longer for participants with more severe psychopathology (i.e., BPD, depressive symptoms, general symptom severity). The findings revealed a substantial delay of receiving appropriate professional care in adolescents with self-harm thoughts and behavior. The correlation between treatment latency and higher psychopathology may emphasize the need of prompt treatment. A better understanding of barriers and facilitators to professional help will contribute to enhance measures of tailored support for young patients in their help-seeking process.

1. Introduction

Self-harm, which includes both suicidal behavior and non-suicidal self-injury (NSSI), is common among adolescents. Moreover, suicide is known to be among the leading causes of death for adolescents in Europe (Steele and Doey, 2007). A systematic review of international literature found that 29.9% of adolescents thought about suicide, and 9.7% attempted suicide at some point in their lives (Evans et al., 2005). Lifetime prevalence of NSSI (i.e. the deliberate act of injuring one's own body tissue without suicidal intent) in adolescents has been estimated at 17% (Muehlenkamp et al., 2012). In cross-sectional and longitudinal studies, NSSI was associated with increased suicidality (Andover and Gibb, 2010; Groschwitz et al., 2015; Koenig et al., 2017), and self-harm regardless of suicidal intent (including both NSSI and SA) increased the risk for later suicide in life (Morgan et al., 2017). Therefore, easy and prompt access to appropriate professional care seems crucial for young individuals with suicidal behavior and NSSI, especially as there are various effective treatment options available for young people experiencing these symptoms. For example, DBT-A and family-centered therapy have been successfully implemented to reduce suicidal ideation and self-harm in adolescents (d = 0.48 - .58; Kothgassner et al., 2021, 2020).

Despite the clear need for early intervention in adolescents engaging in self-harm, only a low proportion of affected adolescents seek professional help. Utilization of professional care is low for mental health problems overall, with only 25% of affected adolescents receiving professional treatment (Sanci et al., 2010). The proportion of those receiving professional help for NSSI and suicidality in particular has been estimated between 10 and 50%, depending on factors such as age, sex, and country (Bruffaerts et al., 2011; Cotter et al., 2015; Evans et al., 2005; Kaess et al., 2020; Ystgaard et al., 2009). Alongside low utilization rates of professional health care, an additional burden for effective treatment is the common delay in seeking help. For adults that eventually sought help for mental health problems, it took between 7 and 11 years from first symptom onset until treatment (Olfson et al., 1998; Wang et al., 2007, 2004). Aside from these overall estimates on help-seeking duration for adults, there is sparse evidence on patterns and correlates of the delay in initial contact to the mental healthcare system, especially in adolescents. This lack of research on help-seeking duration is in contrast to the extensive literature that exists on general help-seeking thoughts and behaviors in adolescents (Rowe et al., 2014). Some studies addressed the help-seeking duration in young patients with psychosis, but this was complicated by the rather gradual onset of first symptoms (Bechard-Evans et al., 2007; Dominguez et al., 2013). To our knowledge, help-seeking duration has not been analyzed for adolescents with NSSI and/or suicidal behavior in particular.

Accordingly, little is known about the factors that may influence the help-seeking duration in adolescents. In prior studies on adults, a shorter help-seeking delay was found for females compared to males (Kessler, 1986; ten Have et al., 2013). This pattern is in line with a higher overall mental healthcare utilization in women, often attributed to a higher willingness to seek help for emotional problems when compared to men (Kessler et al., 1981; Mackenzie et al., 2012). Further, there are indications that initial help-seeking is faster for individuals who have more severe mental health issues compared to patients with lower psychological distress (Leaf et al., 1988; Wang et al., 2000). This may be explained by a higher problem recognition in these individuals, associated with a greater perceived need for care (Thompson et al., 2004). Different disorders have been associated with a varying duration from first symptom onset until treatment utilization. The longest delay has been found in help-seeking for anxiety disorders, whereas initial contact was fastest for mood disorders (Wang et al., 2007). So far, help-seeking duration in personality disorders has not yet been examined. However, as individuals with borderline personality disorder (BPD) utilize mental healthcare more often compared to other psychiatric patients (Bender et al., 2001), and predictors of treatment contact and treatment delay were often similar (ten Have et al., 2013), a shorter help-seeking duration for BPD patients could be assumed.

Many psychiatric disorders have their onset in adolescence (Kim-Cohen et al., 2003), and both NSSI and suicidal behavior can be considered as a transdiagnostic marker of mental disorders and suicide risk in this age group (Bridge et al., 2006; Ghinea et al., 2020). Since delayed treatment of mental illness has been associated with increased symptom severity and lethality (Melle et al., 2008; Nery-Fernandes et al., 2012), the prompt treatment of self-harming adolescents and its associated disorders seems of particular importance. A precise description of help-seeking duration for self-harm thoughts and behaviors in adolescents as well as the analysis of potential influential factors may contribute to a better understanding of barriers to help-seeking and can help to ultimately improve mental healthcare provision. Thus, the aim of the present study was to describe the duration from initial onset of thoughts or incidents of self-harm (NSSI and suicidal behavior) until first clinical presentation in adolescents and to evaluate effects of sex and psychiatric factors on help-seeking duration.

1. Methods

2.1 Participants and procedure

Baseline data were obtained from the AtR!Sk cohort-study at the outpatient clinic for risk-taking and self-harm behaviors (AtR!Sk; *Ambulanz für Risikoverhalten & Selbstschädigung*; Kaess et al., 2017), conducted at the Clinic for Child and Adolescent Psychiatry, Centre of Psychosocial

Medicine, University Hospital Heidelberg. AtR!Sk is a specialized outpatient clinic for children and adolescents with self-harm and risk-taking behavior. The AtR!Sk cohort study was approved by the Ethical Committee of the Medical Faculty, Heidelberg University, Germany (Study: ID S-449/2013) and carried out in accordance with the declaration of Helsinki (World Medical Association, 2013). All participants and their legal guardians provided written informed consent. Following first consultation, patients underwent an extensive diagnostic assessment, including semi-structured interviews and questionnaires as detailed below. Experienced clinicians held these interviews with regard to the patient's personal timeline and specific life events, and patient's caregivers were involved, enabling a reliable data assessment. Individuals who reported risk-taking (e.g., substance abuse, binge drinking, sexual risk-taking) or self-harm (NSSI or suicide attempts) behaviors were included in the scientific evaluation of AtR!Sk. From June 2013 until January 2021, N = 672 individuals (82% female) aged 11 to 19 (M = 15.02, SD = 1.46) met these criteria and provided written informed consent. 95% of participants fulfilled criteria for at least one psychiatric diagnosis, with affective (63%), BPD (32%), and anxiety disorders (30%) being most frequent. For more information on sample characteristics, see Table 1.

Table 1
Sociodemographic and clinical characteristics of the sample (N = 672).

	N/M	%/SD
Female sex (N/%)	555	82.59
Age (M/SD)	15.02	1.46
School type[a] **(N/%)**		
Gymnasium	234	34.98
Realschule	232	34.68
Hauptschule	74	11.06
Other	90	13.39
Household composition (N/%)		
With biological mother	534	81.78
With other mother figure	34	5.21
With no mother figure	85	13.02
With biological father	321	52.45
With other father figure	101	16.50
With no father figure	190	31.05
Residential youth service	57	8.48
Experience of abuse or neglect in childhood[b] **(N/%)**	397	65.51
Clinical diagnoses ICD-10[c] **(N/%)**		
F0 (Organic, including symptomatic, mental disorders)	0	0.00
F1 (Mental and behavioural disorders due to psychoactive substance use)	149	22.11
F2 (Schizophrenia, schizotypal and delusional disorders)	0	0.00
F3 (Mood [affective] disorders)	426	63.20
F4 (Neurotic, stress-related and somatoform disorders)	264	39.17
F5 (Behavioral syndromes associated with physiological disturbances and physical factors)	83	12.31
F6 (Disorders of personality and behaviour)	290	43.03
Borderline Personality Disorder (BPD)	216	32.24
F8 (Disorders of psychological development)	0	0
F9 (Behavioral and emotional disorders with onset usually occurring in childhood and adolescence)	188	27.89

[a] Gymnasium: 8 years of school after 4 years of elementary school, terminating with the general qualification for university entrance; Realschule: 6 years of school after 4 years of elementary school, terminating with a secondary school level-I certificate; Hauptschule: 9 years of elementary school. Percentages take account of missing values.

[b] Based on the Childhood Experience of Care and Abuse Questionnaire (CECA.Q)

[c] Multiple diagnoses possible.

2.2 Measures

Alongside basic sociodemographic and clinical variables, patients were asked to indicate the year of first contact to a professional child and adolescent psychiatric service. The diagnostic assessment included several semi-structured interviews: The Self-Injurious Thoughts and

Behaviors Interview: German (SITBI-G; Fischer et al., 2014) was used to quantify lifetime thoughts and incidents of NSSI as well as suicidal thoughts and behaviors. The SITBI includes questions concerning the participants age at first occurrence of different symptoms, i.e. thoughts of self-injury, self-injurious behavior, suicidal thoughts, and suicide attempts. The German version of the Mini International Neuropsychiatric Interview for Children and Adolescents (MINI KID, Sheehan et al., 2004) and the Structured Clinical Interview for DSM-IV, Axis II (SKID-II; Wittchen et al., 1997) were used to assess psychiatric pathology. In addition to the face-to-face interviews, participants completed various online questionnaires from home: The Depressionsinventar für Kinder und Jugendliche is a German self-report scale that measures severity of depressive symptoms in children and adolescents (DIKJ; Stiensmeier-Pelster et al., 2014). The Symptom-Checklist-90-R (SCL-90-R; Franke, 1995) consists of 90 items covering a variety of psychological symptoms. For each symptom the induced distress is assessed (rated 0-4). The SCL-90-R Global Severity Index (GSI) provides information on overall psychological distress.

2.3 Data analysis

Four variables quantifying help-seeking duration (HS-DU) were derived: years until help-seeking following incidence of (i) first thoughts to engage in self-injury, (ii) years since actual first self-injurious behavior, (iii) years since first thoughts on suicide, and (iv) years since first suicide attempt. These variables were calculated by subtracting age at respective symptom onset, as reported within the SITBI interview, from age at first contact to a professional child and adolescent psychiatric service. Age at first contact to a professional child and adolescent psychiatric service was calculated by subtracting the year of participants' birth from the year of first contact to a professional child and adolescent psychiatric service. Data were corrected for implausible values where possible (e.g., year of first contact to a professional psychiatric service was in the future). N = 82 participants (12%) were excluded from calculations due to a lack of information on the time of their first contact to a professional child and adolescent psychiatric service. Further n = 17 participants (3%) were excluded from analyses because their reported age at first contact to a professional psychiatric service or the age at first symptom onset was lower than six years, as the very limited knowledge on self-harm thoughts and behaviors of small children compromises the plausibility, reliability, and validity of data from this source. For all analyses of HS-DU, only cases with information on the respective symptom onset including the information on the year of first occurrence were considered.

Descriptive statistics were calculated to depict HS-DU for different self-harm thoughts and behaviors. Findings of negative HS-DU in the investigated data indicated that, in some

instances, onset of self-harm thoughts and behaviors occurred after the first contact to the professional health care system. In order to examine an explicit *delay* in help-seeking (help-seeking delay; HS-DE), additional analyses were run for individuals who sought help after onset of self-harm thoughts and behaviors only, excluding those that experienced onset after receiving professional help (negative HS-DU). To gain a better understanding of the negative HS-DU values, these were analyzed separately as well. Consequently, group differences for sex (*female* versus *male*) and BPD (*present* versus *not present*) on HS-DU and HS-DE were analyzed using two sample t-tests. Correlational analyses were calculated to examine the association between HS-DU and HS-DE with symptom severity, as indexed by global DIKJ scores (depression severity) and SCL-90-R (overall symptom severity). To depict cumulative help seeking probabilities, Kaplan-Meier curves (Kaplan and Meier, 1958) were generated. All analyses were conducted in Stata/SE (15.0, Stata Corp LLC, College Station, TX, USA), at an alpha level of 0.05.

2. Results

3.1 Help-seeking duration and help-seeking delay

Average HS-DU ranged from -0.64 to 1.29 years for different symptoms. In 22% of overall cases, the first self-harm thoughts and behaviors occurred after contact to professional care was already established. Excluding those with negative HS-DU values, the shortest HS-DE was found following the first reported suicide attempt, and was longest after first thoughts of self-injury. The average interval between symptom onset and interview was *M* = 2.05 years (*SD* = 1.84). The interval between help-seeking and interview was *M* = 1.69 years (*SD* = 2.58). For a detailed overview on HS-DU and HS-DE values see Table 2.

3.2 Effects of sex

HS-DU differed between boys and girls regarding their first suicide attempt ($t_{(255)}$ = 2.27, *p* = .024), and the onset of NSSI ($t_{(502)}$ = 2.22, *p* = .027). Average HS-DU of boys was negative regarding both first suicide attempt and first NSSI. When only the negative values were included, boys reported longer durations than girls from first contact to a professional child and adolescent psychiatric service to first suicide attempt ($t_{(82)}$ = 2.51, *p* = .014) and first NSSI ($t_{(108)}$ = 2.13, *p* = .036), with an average duration for males of -5.57 years (*SD* = 2.21, 95% CI = -6.85 - -4.30) and -4.57 years (*SD* = 2.31, 95% CI = -5.62 - -3.52) respectively. There were no significant differences between boys and girls for other symptoms that were assessed. HS-DE did not differ between males and females for any of the reported self-harm thoughts and behaviors. For a detailed description, see Table 3.

Table 2
Duration between first occurrence of self-harm thoughts and behaviors and first contact to child and adolescent psychiatry in years for different symptoms.

Self-harm thoughts and behaviors	HS-DU				HS-DE		
	n	*M*(*SD*)	95% CI	negative values (%)	*n*	*M*(*SD*)	95% CI
Thoughts of suicide	478	0.54(2.96)	0.27–0.80	23	367	1.74(1.84)	1.55–1.93
Suicide attempt	257	−0.64(3.00)	−1.00—0.27	33	173	0.99(1.35)	0.79–1.20
Thoughts of self-injury	154	1.29 (2.60)	0.87–1.70	12	135	1.98(1.80)	1.67–2.28
Self-injury	504	0.49(2.88)	0.24–0.75	22	394	1.65(1.75)	1.48–1.83

Abbreviations: HS-DU Help-seeking duration; HS-DE Help-seeking delay; M(SD) Mean(Standard Derivation); CI Confidence Interval.

Table 3
Duration between first occurrence of self-harm thoughts and behaviors and first contact to child and adolescent psychiatry in years for different symptoms for girls and boys.

Self-harm thoughts and behaviors	HS-DU							HS-DE						
	Girls			Boys				Girls			Boys			
	n	*M*(*SD*)	95% CI	*n*	*M*(*SD*)	95% CI	*p*	*n*	*M*(SD)	95% CI	*n*	*M*(SD)	95% CI	*p*
Thoughts of suicide	414	0.61(2.82)	0.33 – 0.88	64	0.03(3.70)	−0.89 – 0.96	.143	324	1.71(1.76)	1.51 – 1.90	43	1.98(2.32)	1.26 – 2.69	.366
Suicide attempt	226	−0.48(2.82)	−0.85 – −0.11	31	−1.77(3.94)	−3.22 – −0.33	.024	156	0.96(1.34)	0.74 – 1.17	17	1.35(1.46)	0.60 – 2.10	.249
Thoughts of self-injury	136	1.24(2.60)	0.79 – 1.68	18	1.67(2.61)	0.37 – 2.97	.510	118	1.98(1.71)	1.67 – 2.29	17	1.94(2.41)	0.70 – 3.18	.929
Self-injury	441	0.60(2.70)	0.35 – 0.85	63	−0.25(3.87)	−1.23 –0.72	.027	352	1.63(1.65)	1.45 – 1.80	42	1.90(2.39)	1.16 – 2.65	.327

Abbreviations: HS-DU Help-seeking duration; HS-DE Help-seeking delay; M(SD): Mean(Standard Derivation); CI Confidence Interval.
p-values refer to two-tailed t-tests.

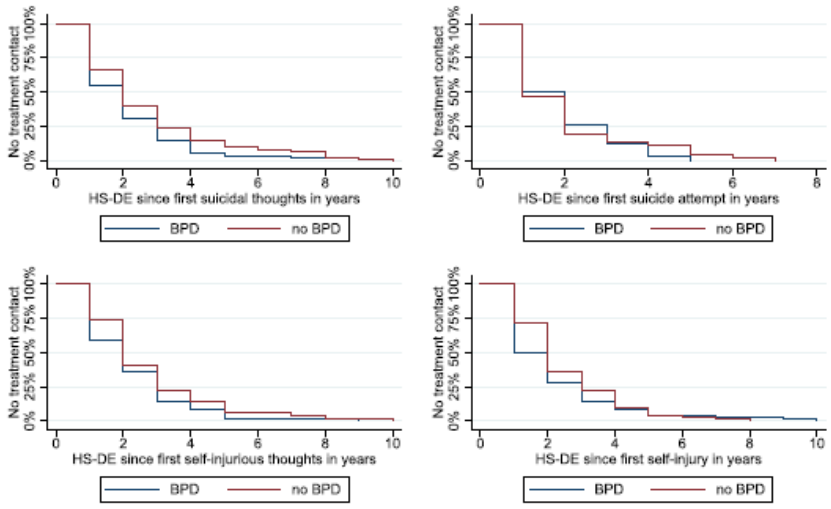

Fig. 1. Probabilities of remaining untreated for self-harm thoughts and behaviors for patients with and without BPD. Abbreviations: BPD Borderline personality disorder; HS-DE Help-seeking delay.

3.3 Effects of BPD and symptom severity

Participants with BPD sought help later than those without BPD when they first experienced suicidal thoughts ($t_{(476)}$ = -2.64, p = .009) or NSSI ($t_{(501)}$ = -2.21, p = .027). The groups did not differ in HS-DU for other symptoms when negative values were included. Regarding HS-DE only, participants with BPD needed significantly more time to seek professional help than those without BPD after their first reporting of thoughts of suicide ($t_{(365)}$ = -3.70, p < .001) and following the onset of NSSI ($t_{(391)}$ = -2.55, p = .011), as illustrated in Figure 1. For a detailed description, see Table 4.

Individuals with greater general symptom severity (SCL-90-R GSI) needed more time to seek help following incidence of suicidal thoughts in terms of HS-DU and HS-DE. General symptom severity had no association with HS-DU nor HS-DE for other self-harm thoughts and behaviors.

Depressive symptoms (DIKJ) were positively correlated with HS-DU for thoughts of NSSI. There were no other significant associations between depressive symptoms and HS-DU, nor were there any associations with HS-DE. For a detailed description, see Table 5.

Table 4
Duration between first occurrence of self-harm thoughts and behaviors and first contact to child and adolescent psychiatry in years for different symptoms for individuals with and without BPD.

Self-harm thoughts and behaviors	HS-DU							HS-DE						
	With BPD			Without BPD				With BPD			Without BPD			
	n	*M(SD)*	95% CI	*n*	*M(SD)*	95% CI	*p*	n	M(SD)	95% CI	*n*	M(SD)	95% CI	*p*
Thoughts of suicide	168	1.02(3.15)	0.54 – 1.50	310	0.27(2.82)	−0.04 – 0.59	.009	131	2.21(2.12)	1.84 – 2.57	236	1.48(1.60)	1.27 – 1.68	<.001
Suicide attempt	119	−0.33(2.82)	−0.84 – 0.18	138	−0.91(3.13)	−1.43 – 0.38	.123	79	1.16(1.49)	0.83 – 1.50	94	0.85(1.21)	0.60 – 1.10	.128
Thoughts of self-injury	70	1.31(3.01)	0.60 – 2.03	83	1.27(2.23)	0.78 – 1.75	.908	59	2.25(2.01)	1.73 – 2.78	75	1.77(1.61)	1.40 – 2.78	.127
Self-injury	170	0.89(2.83)	0.46 – 1.32	333	0.29(2.89)	−0.02 – 0.60	.027	136	1.96(1.68)	1.68 – 2.25	257	1.49(1.76)	1.28 – 1.71	.011

Abbreviations: BPD Borderline Personality Disorder; HS-DU Help-seeking duration; HS-DE Help-seeking delay; M(SD): Mean(Standard Derivation); CI Confidence Interval.
p-values refer to two-tailed t-tests.

Table 5
Correlations of help-seeking delay and help-seeking duration for different self-harm thoughts and behaviors in years with symptom severity (SCL-90-R) and depressive symptoms (DIKJ).

Self-harm thoughts and behaviors	HS-DU						HS-DE					
	SCL-90-R GSI			DIKJ			SCL-90-R GSI			DIKJ		
	n	r	p	n	r	p	n	r	p	n	r	p
Thoughts of suicide	434	.15	.002	431	.07	.155	339	.17	.001	336	.09	.090
Suicide attempt	229	.06	.328	227	.01	.986	157	.01	.875	156	.01	.872
Thoughts of self-injury	150	.15	.069	149	.21	.009	132	.06	.466	131	.11	.203
Self-injury	456	.08	.076	452	.05	.293	362	.05	.360	359	.01	.978

Abbreviations: HS-DU Help-seeking duration; HS-DE Help-seeking delay; SCL-90-R GSI Symptom Checklist-90 Global Severity Score; DIKJ Depressionsinventar für Kinder und Jugendliche.
Reported values are Spearman's rho correlations.

4. Discussion

The aim of the present study was to investigate adolescent help-seeking patterns by examining the duration from first onset of self-harm thoughts and behavior until clinical presentation. In almost a quarter of cases, this duration (HS-DU) was negative, indicating that the first self-harm thoughts and behaviors occurred after contact to professional care was already established. Focusing on the remaining sample with actual help-seeking delay (HS-DE), 12 months passed until participants sought help after their first suicide attempt. Average HS-DE was 20 months after first NSSI, 21 months after first suicidal thoughts, and 2 years after first thoughts of NSSI. The time span and the effects of demographic and psychiatric factors on HS-DU varied depending on the help-seeking variable assessed as well as the nature of thought and behavior investigated.

4.1 Help-seeking duration and help-seeking delay

Patients in the present sample had their initial contact to a professional child and adolescent psychiatric service around 1-2 years after their symptoms occurred, when only looking at patients with actual HS-DE. Given that a help-seeking delay of many years up to decades is consistently reported for adults who eventually sought help for mental health problems (Christiana et al., 2000; Wang et al., 2007), a maximum delay of 2 years appears quite short at first sight. However, considering the mean age in the present sample was only 15 years, 24 or even 12 months of untreated NSSI or even suicidal behavior can be considered a long time. The only pre-existing data on help-seeking delay for mental illness in adolescents stems from studies in youths with first episode psychosis, who sought professional help about 2-6 months after symptom onset (Dominguez et al., 2013; O'Callaghan et al., 2010). By comparison, HS-DE within the present sample was rather long, particularly with regard to the potentially life-threatening nature of the reported thoughts and behaviors. Patients in the present sample sought help just before they transitioned from adolescent to adult mental healthcare services, a special period in the life of young patients that needs particular attention with regard to adolescent help-seeking behavior.

Whilst the majority of participants took quite long to seek professional help, in a considerable proportion of observations the first onset of self-harm thoughts and behaviors occurred while patients already were in contact to the professional mental healthcare system. This finding reflects the complex course of mental disorders. Within the present sample, all patients had their first contact to professional mental healthcare when they were children or adolescents. Considering they all reported serious psychiatric symptoms such as NSSI and suicidal behavior at this early stage of life, the symptoms that arose after first contact to professional care might thus be seen as a development of pre-existing problems. This assumption is supported by the finding that especially more severe symptoms, i.e., suicide thoughts, self-injurious behavior, and suicide attempts in particular, occurred after first treatment contact more frequently, whereas for the least severe symptom "thoughts of self-injury" negative HS-DU values were less frequent. Alternatively, some patients may have visited a psychiatrist as a child for one issue and visited the AtR!Sk clinic as adolescents because of new psychiatric problems. Other possible explanations for the delayed symptom onset include imitation effects of other patients, and that the treatment was ineffective or produced new symptoms as side effects. However, although the reasons for delayed symptom onset remain unclear, the present finding underlines the importance of an integral view on the interaction of symptom development and the help-seeking process in child and adolescent psychiatry.

4.2 Effects of sex

Contrary to our hypothesis, there were no significant differences in HS-DE between boys and girls. The original assumption of a longer HS-DE in boys based on investigations in adults and the well documented finding that females reported more service use for mental health problems than males (Cotter et al., 2015; Han et al., 2017). The lack of a sex-specific difference in HS-DE in the present study suggests that the pattern of increased help-seeking behavior in females might not affect the delay in help-seeking for NSSI and suicidality in adolescents, when only looking at those who eventually sought help. This is in line with the evidence on HS-DE for psychosis (Bechard-Evans et al., 2007) and depression (Boerema et al., 2017), where the delay in help-seeking was not affected by participant's sex either.

However, differences between male and female participants became apparent when negative values were included (for HS-DU). Looking only at HS-DU where the clinical presentation happened before the onset of the investigated thoughts and behaviors, HS-DU was longer for boys than for girls regarding suicide attempts and NSSI. With an average of around 5 years from first clinical presentation until symptom onset, it seems that they received help for another problem when they were younger. In fact, youth are most likely to utilize professional mental health care for attention-deficit/hyperactivity disorder (ADHD) and other disruptive behavior disorders, which are more frequent in boys than in girls (Merikangas et al., 2011, 2010). Exploratory analyses for the present sample revealed that diagnoses of ADHD and conduct disorders were more frequent for boys, however, there was no sex difference regarding the average age at first treatment contact. Thus, although there were no sex differences in actual HS-DE for NSSI and suicidality in the present study, and the underlying processes resulting in longer negative HS-DU for boys cannot be completely clarified, the findings highlight that there are sex differences in the process of help-seeking and symptom development that need further investigation, preferably including a higher proportion of male participants.

4.3 Effects of BPD and symptom severity

Participants who met criteria for BPD diagnosis had a higher HS-DE after their first suicide thoughts and after first self-injury. This was in contrast to our hypothesis that individuals with BPD would seek help sooner than those without BPD, which derived from findings on higher service use in BPD patients (Bender et al., 2001). Up to now, there are no studies investigating HS-DE for BPD in particular. However, several studies found a higher burden of disease to be associated with a shorter help-seeking process (Boerema et al., 2017; Leaf et al., 1988; Wang et al., 2000) and, as BPD is a severe disorder with straining symptoms and high impact on everyday functioning (American Psychiatric Association, 2013), one could assume this

consideration was applicable for BPD, too. Accordingly, we assumed that a higher symptom severity would be associated with a shorter HS-DE. However, in line with our findings for patients with BPD again, a higher overall symptom severity (SCL-90-R) was associated with a longer HS-DE after the first suicide thoughts, and, for HS-DU, the duration was longer after the first self-injury thought when more severe depressive symptoms (DIKJ) were reported. Although this seems to contradict the existing research on HS-DE and symptom severity, there are several considerations that match the findings from the present study.

Firstly, the HS-DE in the present sample refers to the very first time the patients sought help for their symptoms. Although the initial contacting of a mental healthcare service is fundamentally different from the help-seeking process for recurring symptoms, demonstrated for example by an extended HS-DE in first-time help-seeking (Han et al., 2017), the majority of existing research on this topic focuses on help-seeking in later stages (Wang et al., 2004). Patterns from these observations cannot necessarily be transferred to first time help-seeking, highlighting the need for targeted studies on the initial help-seeking process.

Secondly, there is evidence that individuals experiencing an exceedingly high burden of mental illness, especially suicidality, are in turn rather unlikely to seek professional help (Wilson and Deane, 2011). As the sample included in this study consisted only of adolescents who were heavily affected by NSSI and suicidal behavior, this so-called help negation effect might explain longer HS-DE for individuals with additional BPD diagnosis, more severe depressive symptoms and higher overall symptom severity.

Finally, it must be noted that measures of symptom severity and BPD symptoms were only taken once participants already sought help. Thus, rather than arguing that symptom severity affected HSD, one could assume that those who sought help later, developed more serious impairments, as it has been reported for many mental illnesses, e.g. untreated psychosis (Lieberman and Fenton, 2000) and mood disorders (Ricky et al., 2017). In exploratory post-hoc analyses, the association of HS-DU and symptom severity was not explained by a correlation of symptom severity and age, a connection that could have been an indicator for a mental health deterioration over the past years. However, as the present study allows for cross-sectional analyses only, prospective investigations will be necessary in order to confirm underlying directional relationships. Nonetheless, it is possible that our data point to a potential benefit of early detection and intervention of NSSI and suicidal behavior including associated disorders such as BPD, and that a longer duration of untreated illness may result in higher illness severity, e.g., more symptoms of BPD (Chanen et al., 2017; Kaess et al., 2014).

4.4 Limitations

All measures were assessed when participants had their first contact to the AtR!Sk outpatient clinic. This cross-sectional design does not allow any directional or causal conclusions, and the retrospective statement on the first occurrence of symptoms might not be reliable at all times. Recall accuracy is a controversial topic in the research on help-seeking duration. For adolescents, as described above, this research has so far focused on psychosis, the onset of which is gradual and ambiguous and thus difficult to remember (Register-Brown and Hong, 2014). In contrast to this, events like the first suicide attempt or the first time seeking professional help are usually very clear-cut and memorable and, at the time of data assessment, were only 2.05 years (for symptom onset) or 1.69 years, respectively, (for initial help-seeking) in the past. Further, patients were supported by their caregivers and by experienced clinicians to give reliable answers, e.g., by referencing dates to specific life events. However, the exact date of these events could not be reliably assessed, thus the calculation of HS-DU was based on more general and more reliable information (i.e. age of symptom onset and year of help-seeking). This approximation of HS-DU in years seems helpful to gain a first insight to the, up to date, sparsely researched field of help-seeking duration in adolescents. Importantly, the cross-sectional design of the present study cannot confirm any causal relationships. However, as there are few data available at this point, the observed relationships give a first impression of adolescent HS-DU and point out where future investigations, using prospective study designs, are indicated. Thus, although causal associations remain unclear and HS-DU is approximated in years, the findings do present valid insights into help-seeking duration and delay in adolescents with NSSI and suicidality and suggest several possible influencing factors.

Further, the sample consisted only of clinical patients with high symptom severity, who eventually sought help, representing a rather specific subgroup of adolescents with mental health problems. Also, the uneven gender distribution with 82% female patients must be noted. The overrepresentation of girls in psychiatric settings is common (Cailhol et al., 2012; Mackenzie et al., 2012), however it does limit the generalizability of our findings to male adolescents and complicates interpretation of statistical comparisons.

Many of the findings discussed above reached significance for some of the investigated thoughts and behaviors, but not for others. There was no systematic pattern of findings, i.e. no systematic differences in significant effects between symptoms of suicidality vs. NSSI, or symptoms of intention vs. behavior. All calculated mean values and correlation coefficients suggested a trend for longer HS-DU for individuals with BPD and with higher symptom severity after every assessed symptom of NSSI and suicidality, even though the effect only reached significance for those with more observations. A strict separation of HS-DU between different

symptoms is additionally difficult, as most participants reported more than one symptom and it is unclear for which exact problem they sought help. Thus, rather than focusing on special symptoms, the finding that a higher symptom severity is associated with longer first-time HS-DU can be regarded as a trend in adolescents with NSSI and suicidality in general.

4. Conclusions

The present study is the first to investigate help-seeking duration and delay in self-harm thoughts and behavior in a consecutive clinical sample of adolescents. The notable proportion of new symptoms that occurred following treatment onset highlight the complexity of symptom development in young patients, especially for boys. Excluding the belated occurrence of symptoms, there was a delay from first symptom onset until clinical presentation of up to two years in some cases. Considering the urgency of prompt treatment for both suicidality and NSSI, adolescents remained untreated for a significant long period of time. The association of later treatment contact and higher symptom severity emphasizes the need to accelerate the help-seeking process. A better understanding of barriers and facilitators to professional help will contribute to enhance measures of tailored support for young patients in their help-seeking process. In order to understand the exact interrelation of mental illness, help-seeking duration, and influencing factors, longitudinal research is critical. Identifying and targeting causes for enhanced help-seeking duration is of particular importance to avoid manifestation of mental illness in early years and to improve the mental health of patients not only in their youth but for their entire lifetime.

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