Patients' experiences in a guided Internet- and App-based stress intervention for college students

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Patients' experiences in a guided Internet- and App-based stress intervention for college students: A qualitative study
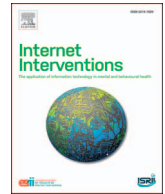
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ABSTRACT

Introduction: Academic education is often associated with increased stress and adverse effects on mental health. Internet-based interventions have shown to be effective in reducing stress-related symptoms. However, college students as target group so far have not been reached appropriately with psychological interventions and little is known about college students' perception of Internet-based stress management interventions. The objective of this study was to explore the experiences of students participating in an Internet- and App-based stress management intervention originally developed for stressed employees and subsequently adapted and tailored to college students.

Method: Semi-structured interviews were conducted with ten participants selected from a randomized controlled trial that evaluated the effectiveness of an Internet- and App-based stress training. The selection of participants aimed to include students with different levels of treatment success. In order to enable an in-depth examination of intervention elements causing dissatisfaction, the interviews were systematically adapted regarding participants' statements in a precedent questionnaire. The interview material was analyzed based on the grounded theory method and thematic analysis.

Results: Results suggest students perceive a necessity to adapt Internet-based interventions to their particular needs. Students' statements indicate that a scientific perspective on the intervention and instable life circumstances could be student-specific factors affecting treatment experience. General themes emerging from the data were attitudes towards individualization and authenticity as well as demands towards different functions of feedback.

Discussion: Participants' experiences hint at certain intellectual and lifestyle-related characteristics of this population. Future studies should explore whether adaptions to these characteristics lead to a higher acceptance, adherence and effectiveness in the target population.

1. Introduction

1.1. Theoretical background

Internet and mobile-based Interventions (IMIs) have shown to be effective for the prevention (Sander et al., 2016; Ebert et al., 2017) and treatment of a wide range of mental disorders (Andersson et al., 2014, 2016; Andrews et al., 2010; Königbauer et al., 2017; Olthuis et al., 2015; Richards and Richardson, 2012; Zachariae et al., 2015; Ebert et al., 2015a, 2015b).

Although a variety of studies has examined the efficacy of IMIs concentrating on stress reduction of adult populations in general (Heber et al., 2017), only a small number has evaluated such treatments in college students (Chiauzzi et al., 2008; Cavanagh et al., 2013; Hintz et al., 2015) with mixed results. This is particularly problematic since academic education is associated with an augmentation of chronic stress, resulting in an increased burden of disease due to mental health disorders (Kubendran and Samuel, 2011; WHO, 2008). Not only are approximately 20 to 30% of western college students experiencing clinical symptoms of a mental disorder (Eisenberg et al., 2011; Auerbach et al., 2016). Most remarkably, two thirds of all mental health disorders have their onset before the age of 25 (Kessler et al., 2005). This underlines the importance of tackling academic stress for the prevention and early treatment of mental disorders.

Since it has been found that the vast majority of college students does not receive any mental health treatment (Eisenberg et al., 2007; Blanco et al., 2008), IMIs constitute a promising possibility for targeting a population that would remain otherwise untreated (Day et al., 2013). The importance of increasing the acceptance of IMIs in a student population is underlined by the low acceptance rates of IMIs in a range of samples in general (Baumeister et al., 2014; Ebert et al., 2015a, 2015b) and specifically in students (Mitchell and Gordon, 2007). Thus, it is crucial to examine if treatments need to be further adapted to students' needs since they are exposed to a population-specific mixture of potentially stress-inducing factors, including academic demands, the transition into a new developmental stage, financial problems or living away from home (Misra et al., 2000; Gadzella et al., 2004). But there is still no evidence whether adapting IMIs to this specific population constitutes an effective way of increasing treatment utilization.

Thus, to examine this question on a qualitative level, it is crucial to gain insight into students' subjective theories of what factors influence their treatment acceptance and adherence. The little qualitative research on students views on IMIs to date (Elliott et al., 2008; Chan et al., 2016) cannot compensate for the lack of information concerning the user experiences of college student populations (Davies et al., 2014). To the best of our knowledge, none of the previous research so far has focused on students' perceptions of an IMI for stress management in particular.

Prior qualitative studies on the acceptance of IMIs have quite unanimously underlined the demand for a stronger individualization of the intervention (O'Mahen et al., 2015; Rozental et al., 2015) and of the therapist support (Ly et al., 2015). Concerning interventional feedback, participants expressed the importance of tailoring both the amount and the type of feedback to their individual needs (Svartvatten et al., 2015). Although the potential for increasing individualization is limited due to the format of IMIs, it is crucial to examine the reasons why participants seek individualized support. In a study by Gerhards et al. (2011), for instance, some participants strived for personalized support in order to increase their commitment while others sought personal contact as a purpose in itself or in order to gain deeper insight into the treatment-delivered information. This distinction allows to elicit which needs underlying the demand for individualization may possibly be met by other means that constitute a more cost-effective and therefore viable way of improvement. For example, the need for a deeper understanding of the treatment information could possibly be met by a stronger focus on presenting background knowledge as indicated by Macdonald et al. (2007) who found a discrepancy between the participants' interest in understanding the causes of their condition and the interventions' plain focus on symptom reduction. Nevertheless, there is still too little knowledge concerning students' expectations towards individualization of IMIs.

Evaluating the participants' personal experiences by using qualitative methods allows to gain insights into implemented improvements recommended by former studies. In the examined stress intervention for student populations the demand for a better integration of personal use devices in the treatment process (Boggs et al., 2014) was met by diary and coaching options. In former studies the participants' requests for optional modules to choose from (O'Mahen et al., 2015) was met by a library of elective modules that provided information and exercises for topics considered to be relevant for student population (for further details see 2.1.3). Therefore, we were interested in how participants experienced the implementation of these improvements recommended by former research.

1.2. Aims

The main purpose of the present study was to examine the views of college students who received an IMI with regard to their acceptance of the intervention as well as their adherence to it. This should provide insights into the idiosyncratic standards, needs and preferences of student populations with a focus on discerning how content and structure of IMIs can be improved in order to enhance their conceptual attractiveness for college students.

2. Method

2.1. The main trial

The current study was conducted alongside a two-armed randomized controlled trial examining the efficacy of an Internet-based cognitive behavioral intervention for stress-management aimed at a college student population (registered in the German Clinical Trials Register DRKS00010212).

2.1.1. Design

In total 150 participants were included in the clinical trial and randomized into two conditions: a guided self-help condition receiving support from a therapist with bachelor's degree in Psychology and a waitlist-control group (WLC) receiving unguided self-help after three months. Assessments took place at baseline (T1), at post-treatment (T2, eight weeks after randomization) and at three-month follow up (T3).

2.1.2. Selection of participants

Participants were recruited from German speaking universities (Germany, Austria, Switzerland) via social media insertions, university press reports and student counseling services. Criteria for the trial inclusion were: (i) an age of at least 18 years (ii) enrollment in a German, Austrian or Swiss tertiary education facility (university or technical college) at treatment commence, (iii) elevated levels of perceived stress indicated by scores of ≥ 8 on the Perceived Stress Scale four-item version (PSS-4; S. Cohen, 1983), (iv) Internet access, (v) declaring willingness to provide self-report data at three assessments and (vi) giving informed consent. Exclusion criteria were (i) a diagnosis of dissociative symptoms or psychosis in the past or (ii) moderate suicidality indicated by a score of two ("I feel I would be better off dead") or higher on BDI item nine.

2.1.3. Intervention

The intervention evaluated in the trial *StudiCare Stress* is based on the principles of cognitive behavioral therapy and constitutes a modification of *Get.On Stress*, an online stress management intervention that has been successfully evaluated in a series of randomized controlled trials with employees, showing large effect sizes (Cohen's d ranging from 0.96 to 0.79) for stress as well as moderate effect sizes for depression (ranging from $d = 0.60$ to $d = 0.55$), anxiety (ranging from $d = 0.79$ to $d = 0.50$) and rumination (ranging from $d = 0.58$ to $d = 0.48$; Buntrock et al., 2014; Ebert et al., 2016a; Heber et al., 2016; Zarski et al., 2016).

Several changes were made to adapt the intervention to college students' needs including the integration of metacognitive strategies as well as exercises promoting mindfulness and self-compassion. This approach was introduced taking into account findings on the links between metacognition, perceived stress and negative emotion (Spada et al., 2008; Iijima and Tanno, 2013; Trouillet et al., 2016).

The intervention consisted of eight sessions, seven main modules and one booster session, with each session taking about 30–90 min to complete. Participants were advised to complete one or two sessions per week. The booster session was activated four weeks after completion of the seven modules (Table 1).

All sessions contained text and multimedia components, the latter consisting of audio files guiding participants through muscle relaxation or imagination exercises as well as video clips used for psycho-educative purposes. For each assignment participants could look up how it had been solved by three different student testimonials. Furthermore, ten elective modules could be run through after sessions two to seven. The elective modules provided information, exercises and assignments

Table 1
Intervention sessions.

Session	Name	Content
1	Introduction	Psychoeducation, information about stress and preview for subsequent sessions
2	Problem-solving	Stress management strategies, systematic problem-solving using the 6-steps strategy
3	Muscle- and breath relaxation	Information on basic principles of muscle and breath relaxation, audio exercises for daily use
4	Mindfulness	Coping with self-criticism, mindfulness exercises
5	Acceptance and tolerance	Dealing with unsolvable problems, psychoeducation on and exercises for acceptance and tolerance of unpleasant emotions
6	Self-compassion	Self-criticism in difficult situations, the relation between self-worth and performance, exercises for positive self-support, overcoming dysfunctional perfectionistic schemes
7	My master plan	Recognize early warning signs of your body, strengthen your foundations in life, creating a plan for the future
8	Booster session	Further information on self-help and psychotherapy, evaluation of training transfer, recap of all sessions, feedback

for student-specific topics: social support, rumination and worrying, time management, procrastination, test anxiety, sleep, motivation, nutrition and exercise, writer's block and concentration. Additionally, two personal diary apps could be downloaded to keep track of mood fluctuations and write down worrying thoughts during everyday life.

Participants received feedback by an eCoach, a specially trained student enrolled in a master's program in Psychology. Feedback was given in accordance with the adherence-focused guidance concept (for a detailed description of the adherence-focused guidance see Ebert et al., 2016b). Participants received feedback for a module within 48 h after finishing a session. The feedback was adapted to individual statements made by the participants while completing the modules and gave positive reinforcement for reported successes in order to increase treatment motivation as well as to give information on how well the participant had accomplished the previous session. If very little information was given by a participant on particular topics, the feedback contained encouragements to further explore these topics. On demand, participants could receive more extensive feedback on a certain session or help with unclear tasks. Standardized reminders were sent by the eCoach via e-mail in case a student did not start the next session within ten days after the last feedback. If requested, participants received an "SMS coach" consisting of automatic text messages via mobile phone, which contained short, prompting motivational sentences.

2.2. The qualitative study

2.2.1. Selection of participants

Interviewed participants were recruited from the randomized controlled trial population. The selection of participants was undertaken to include maximum variation with the aim of representing each level of improvement in perceived stress. Improvement in perceived stress was defined as the difference between baseline and post-measurement on the four-item version of the Perceived Stress Scale (PSS-4; Cohen, 1994). Of two possible reasons for the treatment not being effective, namely non-adherence to the treatment and discontent with the treatment concept, we decided to focus on the latter. Only completers were

targeted following the rationale that knowledgeable suggestions on the conceptual improvement of an IMI can only be given if the treatment content is analyzed in its integrity by the interviewed participants. Completers were defined as participants that completed at least the seven main modules, as module eight was a booster session mainly recapitulating the seven main modules but not comprising significantly new content. Also, as key concepts were conveyed until module seven, participants would not have been able to evaluate the treatment in depth after having completed only the first few modules. All participants were recruited from the first arm of the treatment program, receiving the intervention direct after randomization. Table 2 presents the demographics of the ten selected participants as well as their improvement in perceived stress measured by the difference between the pre- and post-treatment PSS-4 scores. Of the ten interviewed participants 60% were female, in contrast to 74% female participants in the trial population (TP). Age ranged from 20 to 32 years with a mean of 24 years ($SD = 4.0$ years) being representative of the trial population ($M = 24$, $SD = 4.1$). 30% of the interviewed participants studied psychology (TP = 18%), another 30% studied economy (TP = 22%) and 20% studied medicine (TP = 10%). The natural sciences chemistry and biology were represented each by one participant (TP = 3% each). 70% of participants were mainly financed by their parents (TP = 64%), one participant financed himself mainly by working (TP = 48%). Also, one participant received federal support (TP = 34%). The mean improvement in perceived stress between pre- and post-measurement was 4.9 points on the PSS-4 scale ($SD = 1.9$; with $M = 3.7$; $SD = 3.0$ in intervention condition of TP).

2.2.2. Interview procedure

Qualitative data was collected through semi-structured interviews consisting of open-ended questions, in which the participants could evaluate their own general experiences as well as their acceptance and adherence concerning the treatment. Interview questions were strategically selected based on the statements given by the participants in a precedent questionnaire, as can be seen in Table 3. After completion of at least seven modules and the self-report questionnaire on perceived

Table 2
Characteristics of selected participants.

No.	Gender	Age	Sessions completed	Degree	Discipline	Financing	Perceived improvement of stress	Diff. PSS-4
1	Female	25	8	Other	Medicine	Parents	Rather little	− 3
2	Male	32	8	Bachelor	Economy	Job	Rather little	− 4
3	Female	24	8	Master	Chemistry	Parents, job	Very much	− 4
4	Female	24	8	Bachelor	Psychology	Parents, job	Little	− 5
5	Male	22	7	Bachelor	Economy	Parents	Rather much	− 4
6	Female	21	8	Bachelor	Economy	Parents	Rather much	− 9
7	Male	20	8	Other	Medicine	Parents	Very little	− 3
8	Female	21	8	Bachelor	Psychology	Parents	Much	− 7
9	Male	30	8	Bachelor	Biology	Parents	Much	− 4
10	Female	22	8	Bachelor	Psychology	Federal support, Job	Rather much	− 6

Abbreviations: Perceived improvement of stress = answer given on a 6-point scale to the question 'How much has your strain decreased?', with reference to the treatment-period; Diff. PSS-4 = difference between pre- and post-measurement (8 weeks after randomization) on the 4-item version of the Perceived Stress Scale.

Table 3
Questionnaire serving as basis for the selection of interview questions.

Acceptance	Interactional levels
Information quality	Information transporting levels
1. How professional did you perceive the (IL)?	Main modules
2. How appropriate did you perceive the detailedness of the information in the (IL)?	Elective modules
3. How comprehensible did you perceive the Information in the (IL)?	Feedback
4. How accessible did you perceive the explanations given to in the (IL)?	
Perceived usability	Information transporting levels
5. How user-friendly did you perceive the (IL)?	Main modules
6. How overseeable did you perceive the (IL)?	Elective modules
7. How appealing was the design of the (IL) to you?	
Personal relevance	Information transporting levels
8. As how relevant to your personal life did you perceive the (IL)?	Main modules
9. Which part of the treatment was most relevant to your personal life? Which part of the treatment did you perceive most irrelevant to your personal life?	Elective modules feedback
10. How new was the information in the (IL) to you?	
11. How good could you identify with the testimonials?	
Perceived utility	All levels
12. As how helpful did you perceive the (IL)?	Main modules
13. Which insights did you develop during the treatment?	Elective modules
14. As how useful did you perceive the (IL) in your everyday life?	Feedback
15. How much did your stress improve during the treatment?	SMS coach
16. As how efficient did you perceive the treatment to reduce your stress-complaints?	Diary applications
Perceived support	All levels
17. How supported did you feel by the feedback of the eCoach?	Feedback
18. Only for Modules: As how supporting did you perceive the reminders?	Main modules
19. How comfortable were you with the degree of anonymity?	
Adherence	Interactional levels
Abidance of instructions	Only compulsory levels
1. How precisely did you follow the instructions?	Main modules
2. How good could you implement the exercises in your everyday life?	
Thoroughness of task-completion	Only compulsory levels
3. How thoroughly did you complete the (IL)?	Main modules
4. How often did you skip tasks in the (IL)?	
Regularity of task-completion	Only compulsory levels
5. How regularly did you complete the (IL)?	Main modules
6. How regularly did you complete the homework of the (IL)?	
Media utilization	Only additional levels
7. How often did you use the (IL)?	Elective modules
	SMS coach
	Diary applications

Abbreviations: IL = Interactional levels. (To capture the participants' experiences with each of the implemented multimedia options two interactional levels were assessed separately in the self-report questionnaire and later in the interview: (1) levels transporting information as the main modules, the ad elective modules and the feedback, and (Andersson et al., 2016) levels focused on knowledge transfer as the feedback, the SMS coach and the diary applications. We associated the adherence-focused feedback with both levels as it consisted of informative facets as well as of motivational facets. Some questions were exclusively applicable to the modules, as questions concerning the testimonials or the homework).

acceptance of and adherence to the treatment, the strategically selected participants were contacted via e-mail. If the participants responded positively, an interview appointment was made. Interviews were conducted between June 2016 and April 2017 by two undergraduate Psychology students via a telephone. After receiving the participants' consent, the interviews were recorded and the recordings were anonymized during transcription. Both interviewers were in the last year of their bachelor program and specially trained to assess qualitative interviews. They were not blinded to the participants' treatment outcomes. The average duration of an Interview was 45 min. In the course of the interview conduction and data analysis, the interview guideline was modified iteratively in order to examine new emerging themes.

2.2.3. Interview structure

The interview was structured to capture participants' experiences through three main question blocks: (i) participants' general attitudes towards the treatment consisting of their reasons for participation, their reasons for choosing an Internet-delivered format as well as their expectations (ii) participants' acceptance of the treatment and (iii) participants' adherence to the treatment.

2.2.3.1. Conceptualization of acceptance and adherence. We defined acceptance as a cognitive component of treatment satisfaction, being best circumscribed as a favorable reception of the treatment. Thus, we

deliberately strived to exceed the established definition of acceptance given in the first model of the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003) which delineates acceptance as the behavioral intent to use information technology (Holden and Karsh, 2010). In contrast, we aimed to include conceptual acceptance, since the main goal of this study consisted in developing recommendations on how the structure and the content of stress-interventions could be adapted in order to increase their attractiveness for a student population. On the basis of this rationale we targeted five facets of acceptance in our interview: perceived quality of information, perceived usability, personal relevance, perceived utility and perceived support. The first four facets were chosen with reference to four items of the client satisfaction Questionnaire (German version of the Client Satisfaction Questionnaire; Nguyen et al., 1983; Boß et al., 2016). The facet of perceived usability was included to capture the participants' acceptance of the user interface, which is a particularity of IMIs. Adherence was delineated as the fulfillment of the behavioral requirements posed by the treatment exceeding mere treatment completion and subcategorized in abidance of instructions, thoroughness of task completion, regularity of participation and extent of media utilization.

2.2.3.2. Selection of interview questions. Including a questionnaire to activate treatment-related memories and to focus on particularly

relevant aspects of the research question is a method recommended by Witzel (1985) in his problem-centered approach. We captured the facets of acceptance and adherence (see Table 3) initially using a questionnaire in which participants could rate each facet operationalization, consisting of a positive adjective on a six-point scale ranging from "1 = *not at all*" to "6 = *very*". Since this study aimed to examine the possibilities of treatment improvement in order to increase its acceptance by the student population, the interview structure was adapted individually to target the facets of the intervention which participants were not entirely satisfied with. Besides fixed questions exploring general attitudes towards the treatment (see supplementary material A.1 and A.2), open-ended questions were included for all facets rated with ≤ 4, which were judged as expression of potential for improvement.

2.2.4. Analysis

The ten interviews were analyzed by combining approaches from thematic analysis (Flick, 2014) and grounded theory (Glaser and Strauss, 1967). Thematic analysis seeks to encapsulate the data to capture the social variety of different perspectives on a certain phenomenon (Flick, 2014). These different perspectives can be summarized under deductively derived themes that represent the main structure of the interview guideline. In contrast, the grounded theory approach aims to condense codes derived from the empirical data into a key theme and to define its relations to the subcategories for the purpose of developing a new theoretical model (Mey and Mruck, 2010). We used thematic analysis to convey an overview of the variety of perspectives given by the participants concerning their own acceptance of the treatment and adherence to it. At the same time, we wanted to exceed the descriptive level by including emergent codes that were independent from thematic categorization, but without aiming to reach the theoretical saturation needed for an extensive grounded theory analysis.

2.2.5. Coding procedure

Interviews were analyzed by using the software f4 (Dresing and Pehl, 2015, version 5.40.0). Initially, text sequences that the authors judged as possibly relevant to the aim of the study were highlighted. These sequences were summarized into meaningful units and allocated to one of the themes that were deductively derived from the facets of acceptance and adherence. Simultaneously, themes emerging from the texts were coded and abstracted into inductively constructed categories. The codes of each analyzed interview were integrated in a preliminary code structure, at the same time altering it in an iterative process. Inductively attained subthemes were grouped into more general themes. Subsequently, the data was reexamined, looking for discrepancies between the material and the resulting themes as suggested in Mey and Mruck (2010, e.g. for inductive coding: paraphrased text sequences expressing the participants' current living situation were summarized in the codes *university attendance phase*, *exam preparation phase* and *thesis writing phase*. Due to the relatedness of these codes to the nature of university life, they were summarized in the theme *phasic everyday life*. This theme was again grouped with another emergent theme *vicissitude of living conditions* into one main theme *instability of life circumstances*. Finally, the text sequences were read again by both authors, on order to make sure that the text sequences really expressed the theme instability of life circumstances).

During the first stage of the analysis process two researchers coded the transcripts independently of each other. In the second stage of cross validation the meaning of the code units was compared. Disagreements concerning the meaning of certain statements, code labels or the theme structure were discussed and revisions were made in an iterative process until a consensus was achieved.

2.2.6. Ethics

The current study was part of a clinical trial, which received ethical approval by the Ethics Committee of the Friedrich-Alexander University Erlangen-Nuremberg (Erlangen, Germany; 322_15 B). The anonymity of the participants was ensured using automatically generated identification numbers and the information given by the participants during the interview was anonymized during the transcription process.

3. Results

The results of the two analysis approaches were summarized separately: codes obtained by thematic analysis were summarized under the main categories derived from the interview topics while codes that emerged independent from the topic list were condensed into four main themes.

3.1. Results of the thematic approach

3.1.1. General attitudes towards the treatment

3.1.1.1. Reasons for participation. Whereas reasons for treatment participation were manifold, several of them had a clear association to university stressors. The majority of participants directly linked their participation to university-related problems, referring to stress during thesis writing (bachelor's thesis, master's thesis), due to learning problems and to exam anxiety. Other participation reasons were related to the participants' specific living conditions: a recent breakup with a partner or a double workload, as can be seen in Table 4. In one case the double workload meant completing two different majors at the same time, in another case it consisted of studying while working full-time: "I have got a full-time job and also study, or both at the same time, and it was getting too much." (Participant 2, male, 32 years old).

More general reasons for participation were the opinion of being stress-prone, the wish to improve time management, or sleep-related complaints. Reasons unrelated to symptom burden were personal interest in psychology studies and dong researchers a favor. While some participants stated being mainly interested in the background information concerning stress, several others expressed being curious to try out the treatment program in general.

3.1.1.2. Reasons for choosing an Internet format. Reasons for choosing an Internet-delivered over a face-to-face treatment were mostly related to the perceived advantages of the treatment format itself: its attractive presentation, anonymity, efficiency, flexibility concerning time and place of exercise and relatively little effort needed for treatment completion (Table 4). Other reasons for choosing an IMI were related to the conditions of treatment supply, such as long waiting periods for face-to-face treatments or the lack of interventions implemented in university routine care. Personal reasons for choosing an IMI were the low psychological threshold and familiarity with online treatments. Also, as recruitment took place via social networks, many participants expressed having discovered the treatment coincidentally and having been attracted by the prospect of not needing to search actively.

3.1.1.3. Expectations. Half of the participants stated expecting little or nothing of the treatment before its commencement (Table 4). Some participants assumed that the treatment would help them prevent the development of stress, whereas less than half of the participants explicitly expressed they had expected the treatment would reduce their stress level. While some participants anticipated that they would receive specific strategies for clearly defined problems, others expected more general information in order to gain new perspectives on their problems, insights into the origin of stress mechanisms or impulses for further research.

3.1.2. Acceptance

3.1.2.1. Quality of information. In the context of information quality, the participants were mainly concerned about the background information supporting statements on exercises and techniques implemented in the treatment. While some participants would have

Table 4
Thematic analysis - general attitudes towards the treatment.

Theme	Main categories	Subcategories	Codes	Amount
Reasons for participation		University-related	Thesis	2
			Learning problems	4
			Exam anxiety	1
	Symptom-related	Living conditions	Breaking up	1
			Double workload	2
		General	Stress-prone	3
			Improve time management	1
			Problems sleeping	1
	Not symptom-related		Interest	6
			As a favor	1
Reasons for choosing Internet-format	Format-related		Attractive presentation	1
			Anonymity	1
			Efficiency	1
			Flexibility	7
			Little effort	2
	Treatment-supply		Long waiting for face-to-face treatments	3
			Lack of university-delivered treatments	1
	Personal		Low psychological threshold	3
			Familiarity	1
			Coincidence	3
			No active search necessary	3
Expectations	Outcomes	Stress-related	Little or nothing	5
			Prevention	2
			Stress-reduction	4
		Strategies	Exam preparation	1
			Improving sleep quality	1
			Improving time management	1
	Information		New perspectives	1
			Insights into formation mechanisms	1
			Impulses for further research	4

Abbreviations: Amount = number of participants having mentioned code at least once.

liked more explanations, others expressed a need for more sources to back up the information delivered in the intervention, as can be seen in Table 5 (for further discussion see 3.2.1). One participant stated that he had the impression that some parts of the treatment were less fact-based, having a touch of alternative medicine:

"I think it would have been cool to have some information to back up everything a little. Because, well I think something like breathing exercises sounded reasonable and logic, whereas mindfulness did not give me the impression of professionality, but rather of being alternative medicine." (Participant 7, male, 20 years old).

3.1.2.2. Perceived usability. Concerning the user-friendliness of the treatment, a topic often referred to was the duration of the sessions (Table 5). In contrast to the demands for more background information presented above, some participants reported that the extended lengths of some sessions constituted an obstacle for them throughout the course of the treatment.

Other participants reported that to them the duration itself was not problematic but that the variability in length of both the main and the elective modules complicated their planning. Also, several participants mentioned treatment structure expressing that they were bothered by the inability to skip between contents and sessions and to adapt the order of the sessions. Some participants suggested that the sessions could be arranged more clearly and felt overwhelmed by the library of elective modules at the end of the sessions.

3.1.2.3. Personal relevance. The majority of participants commented that they perceived the specific strategies, provided partly in the main modules but predominantly in the library of elective modules, as particularly relevant (Table 5): "I thought the library was simply ingenious, I don't know how to say it elsewise, simply great. It was concrete, tangible advice." (Participant 1, female, 25 years old). Other participants perceived the relevance of the emotion-focused sessions as relatively low:

"Perhaps this was because I have both feet on the ground. As I said, it was always in the back of my mind this 'accepting feelings' and so forth, partly I would have not needed that. (…) Yes, well in my opinion the treatment assumed that I had a problem, which was not necessarily there." (Participant 7, male, 20 years old).

Another much discussed topic in relation to the relevance of the treatment was the familiarity of information. In most cases the information was experienced as quite novel in the main and the elective modules. Some of the participants expressed that they were already familiar with much of the information: "I also study psychology and there was much I already knew. But it is certainly helpful to have everything compact and just try it out yourself" (Participant 4, female, 24 years old). One psychology student proposed that it could be useful tailoring the content to the previous knowledge of students: "I don't know if it is too naïve to look at what a person is studying, and if someone is already in an advanced term in Psychology, to assume that she has discussed stress already." (Participant 10, female, 22 years old).

3.1.2.4. Perceived utility. The majority of the participants reported that the treatment had helped them reduce their perceived stress. Participants stating that their stress had only reduced rather little to very little, gave different explanations (Table 5): one participant expressed not having had enough time to implement the exercises correctly, another participant reported that his stress had not been so high before treatment and that he had completed the intervention more for reasons of prevention. Also, one participant stated that the absence of improvement was due to the workload of 80 h a week that he still had to cope with after the treatment had ended.

3.1.2.5. Perceived support. Concerning the support given by the eCoach several participants expressed the wish to talk directly with the coach when they needed support either via telephone or via chat discussion (Table 5). The two main reasons given were too much anonymity and the inability of the eCoach to supply content-related support to the

Table 5
Thematic analysis – perceived acceptance and adherence towards the treatment.

Acceptance			
Themes	Subthemes	Codes	Amount
Quality of information	Background Information	More explanations	1
		More sources	4
	Credibility	Alternative medicine	1
Perceived usability	Duration of the sessions	Extended length	3
		Variability of length	3
	Treatment structure	Skipping between sessions	3
		Adaptability of session-order	2
		Overseeability	3
Personal relevance	Fitting to needs	Specific strategies	7
		Emotion-focused sessions	2
	Familiarity of Information	Much novel Information	4
		Some things familiar through Interest	2
		Familiar through psychology courses	2
Perceived utility	Reasons for lack of improvement	Lack of time	2
		Prevention	1
		High workload	1
		Diffuseness of perceived stress	1
Perceived support	Need for direct communication	Anonymity reduction	1
		Need for content-related support	2
	Additional stress	Stress through reminders	2

Adherence			
Themes	Subthemes	Codes	Amount
Thoroughness of task-completion	Motivational factors	Lacking sense of relevancy	3
		Disinclination to write	2
	Non-motivational factors	Lack of ideas	4
		Problems of comprehension	1
		Time pressure	2
Abidance of instructions	Implementation	Integration in daily routine	4
		Implementing everything	1
		Setting as hindrance	1
Regularity of task-completion	Integration	Problems with time schedule	3
		Interrupted treatment routine	1
Media utilization	SMS Coach	Forgotten existence	3
		Unnoticed	1

Abbreviations: Amount = number of participants having mentioned code at least once.

extent needed (for related information see 3.2.2). Participants stating that they did not perceive the reminders sent by the eCoach as supportive gave as explanation that these reminders constituted an additional stressor.

3.1.3. Adherence
3.1.3.1. Thoroughness of task completion. The main factors the students claimed to have influenced their thoroughness of participation were of motivational nature (Table 5). Reasons stated for decreased motivation were the perceived irrelevancy of certain tasks and a disinclination to write. Further, reasons mentioned for less thorough task completion were lack of ideas, problems understanding the task and time pressure.

3.1.3.2. Abidance of instructions. The main reason stated for not being able to abide task instructions was the inability to integrate the tasks in everyday life (Table 5). One student referred to the setting of one task having been a hindrance to its implementation, as it contained the instruction to sit down on a chair and relax, whereas he did not possess a comfortable chair. Besides that, some participants expressed having problems implementing all techniques presented:

"I know, regarding the order, that the first audio file was for progressive muscle relaxation. I liked it, because it was only fifteen minutes long and you can take that amount of time once a day. But the problem was, that in the next sessions two other audio-files were presented with exercises for acceptance and tolerance and another, and it said please 'try to implement them in your everyday life', and suddenly you had 45 minutes of audio files per day and that wasn't manageable." (Participant 1, female, 25 years old).

3.1.3.3. Regularity of task completion. For the participants, factors that influenced the regularity of task completion were problems integrating the treatment in the time schedule due to the unpredictable length of the sessions mentioned above or the collision with other appointments. Also, participants stated that the differences in their time schedule during semester breaks interrupted the treatment routine (Table 5, further discussed in Section 3.2.1).

3.1.3.4. Media utilization. According to some participants, one reason for not using the SMS coach was that they had forgotten its existence (Table 5). One participant expressed that although he had subscribed to the SMS coach he did not notice it in everyday life due to the mass of reminders he gets on his cellphone every day. He suggested to make the SMS messages more noticeable by using other means than SMS: "Perhaps it sounds strange – over messengers like *WhatsApp* or others" (Participant 2, male, 32 years old).

3.2. Results of the grounded theory approach

As mentioned above four themes that exceeded the boundaries of thematic categorization emerged from the data. Two themes were categorized as particularities of the student population affecting the treatment experience: instability of life circumstances and scientific

Table 6
Grounded theory analysis - themes and sub-themes emergent from the dataset.

Theme categories	Main themes	Subthemes	Amount
Particularities of student population	Instability of life circumstances	Phasic everyday life	7
		Vicissitude of living conditions	3
	Scientific perspective	Scientific foreknowledge	2
		Scientific interest	3
		Need for scientific information	5
Intervention-related attitudes	Demands towards feedback	Repetitive function	1
		Motivational function	3
		Explanatory function	6
	Individualization and authenticity	Individualization of modules	2
		Individualization and authenticity of feedback	5
		Authenticity of testimonials	3

Abbreviations: Amount = number of participants having mentioned code at least once.

perspective. The two other themes comprised general intervention-related attitudes: demands towards feedback as well as individualization and authenticity.

3.2.1. Particularities of student population

The theme particularities of student population was constructed to involve characteristics of the student population potentially affecting their expectations towards the treatment and its acceptance

3.2.1.1. Instability of life circumstances. The instability of the students' life circumstances was present in most interviews in form of at least one of two distinct themes, as can be seen in Table 6. The first theme that emerged from the data was the phasic structure of students' everyday life. In this context, the majority of participants related their stress-experiences to a distinct phase in everyday life. The described stress-related phases were summarized in three categories: the university attendance phase, the exam preparation phase and the thesis writing phase. Some participants connected their stress experience to the exam preparation phase, while others related it to the thesis writing phase. A minority expressed being in university attendance phase while experiencing stress.

Some participants directly linked the helpfulness or the relevance of the treatment to the everyday life situation they were currently experiencing: One participant expressed the treatment helped her particularly in the exam preparation phase, more than in the university attendance phase because when she mainly attends university courses her stress level is relatively low. Another participant stated that during exam preparation phase the emotion focused parts of the treatment were particularly helpful while in the attendance phase the problem-focused parts were more important. A student learning for final exams stated that in her opinion the treatment did not fit into her current situation, as it was addressed rather to students in the university attendance phase:

"Well, if you only have to learn for your final exams, the treatment is not suitable, no. I think it is rather suited for people that are doing their bachelor's or master's degree, more specific during the semester in the first years. In medicine, you only learn during the last term, you don't even have to submit a master's thesis. You don't have any appointments with your supervisor, you just sit at home and study. It makes a difference if you really have a normal university routine or if you learn for a final exam." (Participant 1, female, 25 years old).

The second subtheme of instability of life circumstances emerging from the data was the vicissitude of living conditions. Participants related several changes in their living conditions to their particular stress experience. Several participants stated that the main stress-related

change in their living conditions was the transition from bachelor's to master's courses, whereas one of them also gave two other reasons for a stress-related change of living conditions: breaking up after a long-term relationship and moving to a new city.

3.2.1.2. Scientific perspective. The scientific perspective as main theme emerged from three subthemes addressed by participants: previous scientific knowledge, scientific interest and the need for more scientific information (Table 6). Having scientific foreknowledge was mainly stated by psychology students (Section 3.1.2).

Scientific interest being a motivator to take part in the treatment was expressed by several participants: one explained she was interested in gaining insight into another scientific discipline while other reasons were interest in the general procedure of scientific trials in psychology as well as interest to learn the scientific explanations of how mental processes can affect physiological states.

Half of the participants expressed the need for more scientific information. Some of them referred to the scientific advice, asking for more practical tips and for a frequent adaptation of the information to the newest scientific findings. Others expressed a wish for broader disclosure of scientific sources, either referring to scientific evidence concerning the efficacy of the treatment or referring to information on the mechanisms of change by which the different techniques were supposed to work:

"I miss somehow the sources. There was the sentence 'It's like this' but no explanation why. Let's put it this way, it sounds strange: but 'because the brain reacts one way or another' such an additional sentence perhaps would have already helped." (Participant 2, male, 32 years old).

3.2.2. Attitudes towards the treatment

This theme consists of participants' attitudes towards the treatment that we did not regard as specific for student population but as potentially impactful on treatment acceptance

3.2.2.1. Functions of feedback. Three different sorts of attitudes towards the function of the feedback were distinguished: giving importance to the repetitive function, the motivational function and the explanative function of feedback (Table 6). The importance of the repetitive function of feedback was expressed by one participant, stating: "Well I think none the less it is important to read it (the feedback) one day later to recall what one has recently worked on." (Participant 3, female, 24 years old).

All participants that gave importance to the motivational function of the feedback saw it fulfilled by the feedback: "And then I was really pleased that some sentences were individually tailored to the feedback I had given on the session. That increased my motivation due to the obligation I felt toward my coach as I was aware that she knew I was participating and looks closely at what I am doing. And that just motivated me." (Participant 10, female, 22 years old).

The majority of the participants gave importance to the explanative function of the feedback and all expressed dissatisfaction with the feedback received. Reasons given for the dissatisfaction were that feedback was tailored too little to the statements made by the participants, comprised little new information and was little helpful when there were problems of task comprehension.

3.2.2.2. Individualization and authenticity. The majority of participants saw potential of improvement concerning the individualization and authenticity of particular treatment aspects, with following subthemes emerging from the data: individualization and authenticity of the feedback, individualization of the modules as well as authenticity of the testimonials (Table 6).

Half of the participants asked for more individualized feedback, some suggested reducing the standardized part of the feedback which summarized the last sessions content. Others experienced the

individualized part not being authentic enough: they described it as containing empty phrases and being superficial: "Sometimes I had the impression that she tried … well it was said what I had done and if I had succeeded. But sometimes I felt that it was just mentioned pro forma and that it did not go into detail." (Participant 8, female, 21 years old).

Some students also discussed the authenticity of the testimonials. One participant, although satisfied with the testimonials, expressed not knowing if they were real or constructed cases. The others expressed their concern about the testimonial cases. One participant stated he wished the testimonials had reflected in more detail about their emotions. Thus, the testimonials seemed artificial to him. Another student suggested that the testimonials could have had more normal, "imperfect" problems and that there could have been a stronger focus on their development:

"I could not identify so well with them, just a bit and not totally, because I had the impression they were paragons of students, so pseudo, with perfect problems that I don't have. But I thought it was great that you included them, because sometimes I didn't know 'okay what should I write' and then I read them and I thought 'okay, it's like this and that'." (Participant 8, female, 21 years old).

4. Discussion

The main purpose of the present study was to examine college students' experiences receiving an IMI for university-associated stress with a focus on discerning how the content and structure of IMIs can be improved in order to enhance acceptance of and adherence to the interventions. This aim is of significant importance as the population effect of any preventive intervention depends on the acceptance and utilization in the target population (Gun et al., 2011; Ebert et al., 2015a).

The results indicate that participants' experiences correspond to findings of previous research on IMIs for general population samples: the need for more individualization was expressed by many participants in previous research (Ly et al., 2015; O'Mahen et al., 2015; Rozental et al., 2015). Also, participants' requests for more content-related support, more background information and better understanding of their situation are themes discussed by previous studies (Macdonald et al., 2007; Gerhards et al., 2011). The discrimination between functions of feedback demanded by participants to a different extent shows similarity to the differentiation of reasons for seeking individualization found by Gerhards et al. (2011) namely to increase commitment, gain personal contact or deeper insight. Participants' descriptions of sessionlength and frequency of reminders constituting a stress factor correspond with the feeling of overwhelmedness caused by treatment, expressed by participants in the study of Rozental et al. (2014).

Next to these general aspects, there are some student-specific themes which should be considered in the development process of IMIs for students: students' expectancies concerning IMIs could differ from those of the general population due to their scientific perspective on treatment information. Also, data suggests that students' specific needs may differ from those of the general population due to their particularly instable life circumstances, in which the phases of university attendance, exam preparation and thesis writing lead to different problems and stress experiences. Implications of these findings and ways to enhance the appeal of IMIs for a student population will be discussed below.

4.1. Recommendations for the adaptation of IMIs

In the following, recommendations derived from our findings are given with respect to possibilities of further improving the user experiences with IMIs in a student population. In this context, it is crucial for further research to investigate if such adaptations potentially lead only to improved user satisfaction or if they result in an actual improvement concerning the efficacy of and adherence to IMIs in a college student population.

4.1.1. Providing more scientific background information

Future research could examine if it is feasible and fruitful to convey more scientific background information for implemented techniques while at the same time keeping the sessions to a length that does not deplete students' time resources. Perhaps it would be interesting to examine the implementation of additional references. These could lead to a website presenting the research body on efficacy and mechanisms of change that constitute the basis of a particular IMI. Especially when scientists deliver interventions to their students, this might lead to the expectation that the intervention focuses on learning new things and building up further knowledge instead of practicing certain exercises. Therefore, a stronger expectation management could be helpful to clarify that stress management interventions are about practicing and exercising.

4.1.2. Adapting IMIs to limited time resources and the disinclination to write

As these issues were present in our study and others (Beattie et al., 2009; O'Mahen et al., 2015; Rozental et al., 2015), future research could explore further ways to reduce the amount of writing and the duration of each session without loss of information in order to prevent participants to be overwhelmed by the treatment itself. It could be examined, for instance, if the implementation of personal audio memos or dictating functions as optional alternatives to written tasks or diary entries could have a beneficial effect on the adherence of students with a disinclination to write or very limited time resources.

4.1.3. Increasing individualization and authenticity

To reduce participants' experiences of lacking or factitious individualization, further research could explore more efficient ways to fulfill individual demands, especially concerning feedback, in a more authentic manner. In this context, the efficiency and acceptance of receiving feedback through audio-messaging could be examined, since this way of communication could potentially solve several problems: (i) it could improve the motivational function of feedback in context of adherence-focused guidance due to decreased anonymity and perhaps increase perceived authenticity of the semi-standardized motivational messages, (ii) it could improve the explanatory function of the feedback in the context of more intensive support, as participants could be given the possibility to respond per audio message in order to clarify their individual difficulties in understanding instructions or techniques better than in a written format, (iii) it could potentially be as timeefficient as a written feedback since short personal notes would be a sufficient prerequisite to record an audio message.

With regard to the testimonials, it seems necessary to put more effort into constructing narratives that focus on their imperfectness and personal development in order to create more authentic characters.

Also, the necessity of adapting the treatment to the levels of foreknowledge could be explored. For example, future research should investigate whether students with extensive knowledge about mental and behavioral change techniques, such as psychology students or students with a history of mental health treatment, do not adhere to the provided techniques as they might feel not to learn anything new and therefore benefit less from such an intervention.

4.1.4. Regarding students' life circumstances

It could be worthwhile to investigate the effects of tailoring intervention content and treatment flows to the current living circumstances of students, which may be associated with different problems and experiences of stress. As indicated in this study, most students linked their stress to a certain everyday life phase of either university attendance, exam preparation or thesis writing. Some of them suggested that the helpfulness of the treatment depended on the current phase they were experiencing. In the interviews, participants suggested that in the exam preparation phase and the thesis writing phase emotion-focused stress management approaches as well as the structuring of the every-day life gained particular importance. Thus, future research should further

investigate which predominant needs and problems students have in their different everyday life phases and which techniques might be appropriate for each phase. Furthermore, time pressure might fluctuate to a much greater extent in students compared to employees or other target groups. Thus, it is of importance to identify favorable time slots when approaching students and offering them the opportunity to participate in an IMI. With regard to scientific studies, one might randomize participants at a certain time that can be chosen by the students.

4.2. Limitations

The present study has following limitations: (i) As data in this study should be considered in the context of the aims of qualitative research and findings are not generalizable, further quantitative research is needed to examine the representativity of the students' perspectives found in this study. (ii) The last interviews took place three months after the randomized controlled trial had ended. As the participants' memories shaped the reported experiences with the treatment, reported perspectives could be subject to bias such as the fading affect bias (Gibbons et al., 2011). (iii) The aim to select participants due to the principle of maximum variation concerning treatment success could not be achieved fully as all participants that reacted to the interview request showed improvement on the PSS-4 scale. Therefore, it is possible that participants with positive treatment related experiences were overrepresented in the selected sample. Also, the decision not to include dropouts potentially diminished the variety of perspectives expressed by participants, as dropouts could have contributed with different experiences and issues to the evaluation of the intervention. Although these limitations have to be taken into account, with our study aim focusing on the conceptual improvement of the treatment we decided to only include participants that were able to fully analyze the treatment content and structure. Hence future studies should evaluate subjective experiences of non-adhering students' participation in order to derive suggestions on how to improve treatment adherence. It must further be noted that not all faculties were represented, as none of the interviewed participants were enrolled in a technical or liberal arts major. (iv) Also as the coders where not blinded to the improvement of the participants, they might have missed relevant themes in the knowledge that all participants had improved on the PSS-4 scale. (v) Due to the problem-focused approach (Witzel, 1985) pursued by this study, the participants' statements must not be seen as representative for their overall satisfaction with the treatment, since only aspects of the treatment were discussed in depth which participants had not been fully satisfied with. (vi) As the interviews were conducted via telephone, this could have affected the allegiance of the participants to the interviewer and thus influenced which experiences they disclosed. However, some findings (Carlbring et al., 2001; Hopper, 1992) indicate that the lack of eye contact may also be an advantage in facilitating the disclosure of sensitive and important information. (vii) Finally, with regard to comments on superficial feedback it must be considered that coaching was provided by students. Professionals might have provided more individualized feedback. However, students coaching other students could be a promising peer coaching approach that works well for some students but needs more training, supervision and further development.

Results suggest that it may be worthwhile to make further efforts in tailoring IMIs to meet students' scientific standards and their particular needs due to instable life circumstances. Still, it has to be examined, if these adaptations are effective possibilities to improve students' perception of IMIs and thus foster treatment utilization in student population. For future quantitative research, it is also necessary to examine if such improvements can increase actual adherence to those treatments and their efficacy.

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References

Andersson, G., et al., 2014. Guided Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: a systematic review and meta-analysis. World Psychiatry: Official Journal of the World Psychiatric Association (WPA) 13 (3), 288–295. http://dx.doi.org/10.1002/wps.20151.

Andersson, G., et al., 2016. Internet-supported versus face-to-face cognitive behavior therapy for depression. Expert. Rev. Neurother. 16 (1), 55–60. http://dx.doi.org/10.1586/14737175.2015.1125783.

Andrews, G., et al., 2010. Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: a meta-analysis. PLoS One 5 (10), e13196. http://dx.doi.org/10.1371/journal.pone.0013196.

Auerbach, R.P., et al., 2016. Mental disorders among college students in the World Health Organization World Mental Health Surveys. Psychol. Med. 46 (14), 2955–2970. http://dx.doi.org/10.1017/S0033291716001665.

Baumeister, H., et al., 2014. Impact of an acceptance facilitating intervention on patients' acceptance of Internet-based pain interventions - a randomised controlled trial. Clin. J. Pain 31 (6), 528–535. http://dx.doi.org/10.1097/AJP.0000000000000118.

Beattie, A., et al., 2009. Primary-care patients' expectations and experiences of online cognitive behavioural therapy for depression: a qualitative study. Health Expect. 12 (1), 45–59. http://dx.doi.org/10.1111/j.1369-7625.2008.00531.x.

Blanco, C., et al., 2008. Mental health of college students and their non–college-attending peers. Arch. Gen. Psychiatry 65 (12), 1429–1437. http://dx.doi.org/10.1001/archpsyc.65.12.1429.

Boggs, J.M., et al., 2014. Web-based intervention in mindfulness meditation for reducing residual depressive symptoms and relapse prophylaxis: a qualitative study. J. Med. Internet Res. 16 (3), 1–12. http://dx.doi.org/10.2196/jmir.3129.

Boß, L., et al., 2016. Reliability and validity of assessing user satisfaction with web-based health interventions. Journal of Medical Internet Research 18 (8), e234. http://dx.doi.org/10.2196/jmir.5952.

Buntrock, C., et al., 2014. Evaluating the efficacy and cost-effectiveness of web-based indicated prevention of major depression: design of a randomised controlled trial. BMC Psychiatry. BioMed Central 14 (1), 25. http://dx.doi.org/10.1186/1471-244X-14-25.

Carlbring, P., et al., 2001. Treatment of panic disorder via the Internet: a randomized trial of a self-help program. Behav. Ther. 32 (4), 751–764. http://dx.doi.org/10.1016/S0005-7894(01)80019-8.

Cavanagh, K., et al., 2013. 'A randomised controlled trial of a brief online mindfulness-based intervention', Behaviour Research and Therapy. Eberth & Sedlmeier 51 (9), 573–578. http://dx.doi.org/10.1016/j.brat.2013.06.003.

Chan, J.K., et al., 2016. University students' views on the perceived benefits and drawbacks of seeking help for mental health problems on the Internet: a qualitative study. JMIR Human Factors 3 (1), e3. http://dx.doi.org/10.2196/humanfactors.4765.

Chiauzzi, E., et al., 2008. MyStudentBody-stress: an online stress management intervention for college students. J. Health Commun. 13 (6), 555–572. http://dx.doi.org/10.1080/10810730802281668.

Cohen, S., 1983. Perceived stress scale. J. Health Soc. Behav. 24, 386–396.

Cohen, S., Kamarck, T., Mermelstein, R., 1994. Perceived stress scale. Measuring stress: A guide for health and social scientists.

Davies, E.B., Morriss, R., Glazebrook, C., 2014. Computer-delivered and web-based interventions to improve depression, anxiety, and psychological well-being of university students: a systematic review and meta-analysis. J. Med. Internet Res. 16 (5), e130. http://dx.doi.org/10.2196/jmir.3142.

Day, V., McGrath, P., Wojtowicz, M., 2013. Internet-based guided self-help for university students with anxiety, depression and stress: a randomized controlled clinical trial. Behav. Res. Ther. 51 (7), 344–351.

f4 Audiotranskription, Dr. Dresing & Pehl GmbH, Marburg, Germany, 2015.

Ebert, D.D., Berking, M., et al., 2015a. Increasing the acceptance of Internet-based mental health interventions in primary care patients with depressive symptoms. A randomized controlled trial. J. Affect. Disord. 176, 9–17. http://dx.doi.org/10.1016/j.jad.2015.01.056.

Ebert, D.D., Heber, E., et al., 2016a. Self-guided internet-based and mobile-based stress management for employees: results of a randomised controlled trial. Occup. Environ. Med. 73 (5), 315–323. http://dx.doi.org/10.1136/oemed-2015-103269.

Ebert, D.D., Lehr, D., et al., 2016b. Internet- and mobile-based stress management for employees with adherence-focused guidance: efficacy and mechanism of change. Scand. J. Work Environ. Health 42 (5), 382–394. http://dx.doi.org/10.5271/sjweh.3573.

Ebert, D.D., Zarski, A.-C., et al., 2015b. Internet and computer-based cognitive behavioral

therapy for anxiety and depression in youth: a meta-analysis of randomized controlled outcome trials. PLoS One 10 (3), e0119895. http://dx.doi.org/10.1371/journal.pone.0119895.

Ebert, D.D., et al., 2017. Prevention of mental health disorders using Internet and mobile-based interventions: a narrative review and recommendations for future research. Front. Psych. 8, 116. http://dx.doi.org/10.3389/FPSYT.2017.00116.

Eisenberg, D., Golberstein, E., Gollust, S.E., 2007. Help-seeking and access to mental health care in a university student population. Med. Care 45 (7), 594–601.

Eisenberg, D., Hunt, J., Speer, N., 2011. Mental health service utilization among college students in the United States. J. Nerv. Ment. Dis. 199 (5), 301–308.

Elliott, J.C., Carey, K.B., Bolles, J.R., 2008. Computer-based interventions for college drinking: a qualitative review. Addict. Behav. 33 (8), 994–1005. http://dx.doi.org/10.1016/j.addbeh.2008.03.006.

Flick, U., 2014. Qualitative Sozialforschung: Eine Einführung. [An Introduction to Qualitative Research], 6th edn. Rowohlts Enzyklopädie, Hamburg.

Gadzella, B., Stacks, J., Stephens, R., 2004. College students assess their stressors and reactions to stressors. In: Proceedings of Texas A&M University Assessment Conference College Station, TX, USA.

Gerhards, S.A., et al., 2011. Improving adherence and effectiveness of computerised cognitive behavioural therapy without support for depression: a qualitative study on patient experiences. J. Affect. Disord. 129 (1–3), 117–125. http://dx.doi.org/10.1016/j.jad.2010.09.012.

Gibbons, J.A., Lee, S.A., Walker, W.R., 2011. The fading affect bias begins within 12 hours and persists for 3 months. Appl. Cogn. Psychol. 25 (4), 663–672. http://dx.doi.org/10.1002/acp.1738.

Glaser, B.G., Strauss, A.L., 1967. The Discovery of Grounded Strategies for Qualitative Research. Nursing Research, New York: Aldine.

Gun, S.Y., Titov, N., Andrews, G., 2011. Acceptability of Internet treatment of anxiety and depression. Australasian Psychiatry 19 (3), 259–264. http://dx.doi.org/10.3109/10398562.2011.562295.

Heber, E., et al., 2016. Web-based and mobile stress management intervention for employees: a randomized controlled trial. J. Med. Internet Res. 18 (1), e21. http://dx.doi.org/10.2196/jmir.5112.

Heber, E., et al., 2017. The benefit of web- and computer-based interventions for stress: a systematic review and meta-analysis. J. Med. Internet Res. 19 (2), e32. http://dx.doi.org/10.2196/jmir.5774.

Hintz, S., Frazier, P.A., Meredith, L., 2015. Evaluating an online stress management intervention for college students. J. Couns. Psychol. 62 (2), 137–147. http://dx.doi.org/10.1037/cou0000014.

Holden, R.J., Karsh, B.-T., 2010. The technology acceptance model: its past and its future in health care. J. Biomed. Inform. 43 (1), 159–172. http://dx.doi.org/10.1016/j.jbi.2009.07.002.

Hopper, R., 1992. Telephone Conversation. Indiana University Press.

Iijima, Y., Tanno, Y., 2013. The moderating role of positive beliefs about worry in the relationship between stressful events and worry. Personal. Individ. Differ. 55 (8), 1003–1006. http://dx.doi.org/10.1016/j.paid.2013.08.004.

Kessler, R.C., et al., 2005. Lifetime prevalence and age-of-onset distributions of. Arch. Gen. Psychiatry 62 (6), 593–602. http://dx.doi.org/10.1001/archpsyc.62.6.593.

Königbauer, J., et al., 2017. Internet- and mobile-based depression interventions for people with diagnosed depression: a systematic review and meta-analysis. J. Affect. Disord. 223, 28–40. http://dx.doi.org/10.1016/j.jad.2017.07.021.

Kubendra, V., Samuel, S., 2011. A Study on Stress Management Among Student Community. J. Hum. Dev. 3 (1), 71–88.

Ly, K.H., et al., 2015. Experiences of a guided smartphone-based behavioral activation therapy for depression: a qualitative study. Internet Interventions 2 (1), 60–68. http://dx.doi.org/10.1016/j.invent.2014.12.002.

Macdonald, W., et al., 2007. A qualitative study of patients' perceptions of a "minimal" psychological therapy. Int. J. Soc. Psychiatry 53 (1), 23–35. http://dx.doi.org/10.1177/0020764006066841.

Mey, G., Mruck, K., 2010. Handbuch Qualitative Forschung in der Psychologie. 1st edn, Psychologie Schweizerische Zeitschrift Für Psychologie Und Ihre Andwendungen, 1st edn. VS Verlag für Sozialwissenschaften, Wiesbaden. http://dx.doi.org/10.1007/978-3-531-92052-8.

Misra, R., et al., 2000. Academic stress of college students: comparison of student and faculty perceptions. Coll. Stud. J. 34 (2), 236–245.

Mitchell, N., Gordon, P.K., 2007. Attitudes towards computerized CBT for depression amongst a student population. Behav. Cogn. Psychother. 35 (4), 421. http://dx.doi.org/10.1017/S1352465807003700.

Nguyen, T.D., Attkisson, C.C., Stegner, B.L., 1983. Assessment of patient satisfaction: development and refinement of a service evaluation questionnaire. Eval. Program Plann. 6 (3–4), 299–313. http://dx.doi.org/10.1016/0149-7189(83)90010-1.

Olthuis, J.V., et al., 2015. Therapist-supported Internet cognitive-behavioural therapy for anxiety disorders in adults. Adv. Psychiatr. Treat. 21 (5), 290. http://dx.doi.org/10.1192/apt.21.5.290.

O'Mahen, H.A., et al., 2015. Women's experiences of factors affecting treatment engagement and adherence in Internet delivered behavioural activation for postnatal depression. Internet Interventions 2 (1), 84–90. http://dx.doi.org/10.1016/j.invent.2014.11.003.

Richards, D., Richardson, T., 2012. Computer-based psychological treatments for depression: a systematic review and meta-analysis. Clin. Psychol. Rev. 32, 329–342.

Rozental, A., et al., 2014. Consensus statement on defining and measuring negative effects of Internet interventions. Internet Interventions. Elsevier 1 (1), 12–19. http://dx.doi.org/10.1016/j.invent.2014.02.001.

Rozental, A., et al., 2015. Experiences of undergoing Internet-based cognitive behavior therapy for procrastination: a qualitative study. Internet Interventions 2 (3), 314–322. http://dx.doi.org/10.1016/j.invent.2015.05.001.

Sander, L., Rausch, L., Baumeister, H., 2016. Effectiveness of Internet-based interventions for the prevention of mental disorders: a systematic review and meta-analysis. JMIR Mental Health 3 (3), e38. http://dx.doi.org/10.2196/mental.6061.

Spada, M.M., et al., 2008. Metacognition, perceived stress, and negative emotion. Personal. Individ. Differ. 44 (5), 1172–1181. http://dx.doi.org/10.1016/j.paid.2007.11.010.

Svartvatten, N., et al., 2015. A content analysis of client e-mails in guided Internet-based cognitive behavior therapy for depression. Internet Interventions 2, 121–127.

Trouillet, R., Doron, J., Combes, R., 2016. Metacognitive beliefs, environmental demands and subjective stress states: a moderation analysis in a French sample. Personal. Individ. Differ. 101, 9–15. http://dx.doi.org/10.1016/j.paid.2016.05.044.

Venkatesh, V., et al., 2003. User acceptance of information technology: toward a unified view. MIS Q. 27 (3), 425–478.

Witzel, A., 1985. Das problemzentrierte interview. In: Jüttemann, G. (Ed.), Qualitative Forschung in der Psychologie: Grundfragen. Verfahrensweisen, Anwendungsfelder. Weinheim. Beltz, pp. 227–255.

World Health Organization, 2008. The Global Burden of Disease: 2004 update. 978 92 4 156371 0.

Zachariae, R., et al., 2015. Efficacy of Internet-delivered cognitive-behavioral therapy for insomnia – a systematic review and meta-analysis of randomized controlled trials. Sleep Med. Rev. 30, 1–10. http://dx.doi.org/10.1016/j.smrv.2015.10.004.

Zarski, A.-C., et al., 2016. Adherence to Internet-based mobile-supported stress management: a pooled analysis of individual participant data from three randomized controlled trials. J. Med. Internet Res. 18 (6), e146. http://dx.doi.org/10.2196/jmir.4493.