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Coping through blogging: A review of studies on the potential benefits of weblogs for stress reduction

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Abstract

This paper provides a descriptive overview of the empirical evidence for potential effects of reflective weblog writing for coping with stress. Seventeen studies meeting the inclusion criteria are summarized in a systematic synopsis. Sixteen studies focus on self-initiated blogging in informal contexts. Only one study examines mandated weblog writing for coping in an institutionalized context. Results indicate that the public nature of weblogs opens up a variety of possibilities for both problem-focused and emotion-focused coping, most importantly through social support. Although these studies show promising results, it remains unclear if and how the benefits of self-initiated blogging can be transferred to more formal settings. Thus, future research should examine how blogging can be mandated and scaffolded in order to foster coping strategies and decrease stress levels. For this purpose, experimentally controlled and longitudinal studies are needed to evaluate the effectiveness of this approach.

Keywords: weblogs; blogging; writing therapy; coping; stress; review

Introduction: Blogging in Stressful Situations – A New Way of Coping?

In psychology, the concept of “stress” is an umbrella term for a broad range of mostly negative psychological states with potentially health affecting implications (Carver & Vargas, 2011; Dougall & Baum, 2012). Stress can vary not only in duration and intensity but also in symptoms, which differ individually and manifest either biologically (high blood pressure, lack of appetite, sleeplessness, tremors, cardiovascular disease etc.) or psychologically (uneasiness, depression, fear, panic etc.). Stress is seen not as a simple effect of circumstances, but as result of a complex interplay between situations, personality traits and behaviour (Aldwin, 2007). Given the complexity of the psychological stress concept, research faces the challenge to find new ways of helping people deal with diverse and highly individual stress-related experiences. As the state “being stressed” is increasingly seen as normal, there is a need for low-threshold methods for intervention that do not stigmatize individuals as being “in treatment” for minor issues. One of the more recent developments has been the use of internet communication, especially weblogs, for coping with stress. To understand the potential benefits and the relative novelty of this approach, a brief recapitulation of the theoretical underpinnings of coping with stress and writing therapy is necessary.

According to the classical definition of Lazarus (1966, 1999) and Lazarus and Folkman (1984), *stress* is a personal reaction to a situation that is subjectively perceived as threatening (*primary appraisal*) when there is also a subjective lack of resources for confronting it (*secondary appraisal*). By *coping*, people seek to change the stress-inducing situation or reduce the feeling of being stressed (Lazarus & Folkman, 1984). Productive coping can be regarded as either *problem-focused* or *emotion-focused* (Carver, 2011; Folkman & Lazarus, 1980) although there are many further distinctions (Skinner, Edge, Altman, & Sherwood, 2003).

Traditional pen-and-paper journaling has been considered as a helpful tool for both emotion-focused and problem-focused coping (Burt, 1994; Pennebaker, 1993) and research on writing therapy has assumed that disclosure through writing has positive cognitive as well as emotional effects (Pennebaker, 1997, 2004; Peterkin & Prettyman, 2009; Sloan & Marx, 2004). On the cognitive side, writing can lead to an adaptive reframing of situations, e.g. by creating new narratives and interpretations of past situations, recognizing changes in the current situation, or developing new plans for action to change the future situation. On the emotional side, writing can be used as a form of emotional venting and – especially when writing for an audience – can invite empathy and solidarity, either in private or in public. Both aspects are interconnected. However, cognitive reappraisal is expected to lead to a more profound emotional reappraisal than the other way around (Burlinson & Goldsmith, 1998; Lazarus & Folkman, 1984). Summing up the numerous studies following the groundbreaking works of Pennebaker and Beall (1985), meta-analyses have repeatedly shown the positive effects of therapeutic writing (Frattaroli, 2006; Frisina, Borod, & Lepore, 2004; Smyth, 1998; van Emmerik, Reijntjes, & Kamphuis, 2012). These substantial effects can also be explained by the general characteristics of writing. In contrast to talking, writing has many unique characteristics: It allows for more time to think. It produces a fixed record that endures the moment it was created, it can be reread and shared and commented on (independent of time and place). Writing is potentially anonymous, it can be self-initiated or mandated. Hence, many variants of writing interventions exist. Next to the variants of “writing therapy” (collected in Bolton, Howlett, Lago, & Wright, 2004; Lepore & Smyth, 2002), journal writing has been employed as a generic tool to foster reflective practice (Boud, 2001; Hiemstra, 2001; O’Connell & Dymont, 2011). While research on writing therapy has concentrated on mandated journal writing, research on reflective practice and coping has looked primarily at more self-initiated approaches with writing as sort of self-therapy. Today, with the advent of digital writing tools, research needs to address the question of whether these new possibilities can expand the benefits of traditional journaling approaches for both self-initiated and mandated writing procedures (Nagel & Anthony, 2009; Sheese, Brown, & Graziano, 2004; Wright, 2002; Wright & Chung, 2001).

General Properties of Blogging

Weblogs are probably the closest digital equivalent to traditional journals on the Internet. A weblog can be understood as a technological tool as well as a form of individual and social practice. As a technological tool, it is a relatively easy-to-use web-content management system that facilitates the development and maintenance of a chronologically structured website that requires frequent updating (Blood, 2002; Du & Wagner, 2006; Safran & Kappe, 2008). Popular open-source examples are Wordpress (www.wordpress.org) and Drupal (www.drupal.org). Hosted examples run by companies include Blogger (www.blogger.com) and Tumblr (www.tumblr.com). In contrast to other content-management systems, entries (so called “posts”) are usually presented in reverse chronological order. The latest posts are shown on top of the page while older entries are moved down. Posts are commonly grouped by days, weeks and months while older entries are moved into an archive. In many weblog content management systems, posts can be additionally labeled with categories and tags, allowing for alternative ways to find specific content. Weblogs have been the first to adopt a range of new functionalities such as RSS-feeds and trackbacks, giving rise to a so called “blogosphere”, where blogs can be seen as a tool of multilateral communication rather than individual information sharing. The “ease of use” made them a cornerstone of the so called Web 2.0, which was seen as a paradigm shift where common Internet users were enabled to become authors as well (Hew & Cheung, 2013; O’Reilly, 2007). As a social practice, blogging changed the way personal information became a matter of public interest. The term “weblog” was originally coined by John Barger in 1997, who wrote his “Robot Wisdom Weblog” postings on a daily basis in a very personal and informal way, describing his daily online discoveries and thoughts for an unknown and open group of readers. Even today, as weblog software has been adopted and employed by companies and for many other purposes, “blogging” can be conceptualized as an informal way of writing personal thoughts on a regular basis in a chronologically order on a webpage. In other words: “Bloggers are driven to document their lives, [...] express deeply felt emotions, articulate ideas through writing, and form and maintain community forums” (Nardi, Schiano, Gumprecht, & Swartz, 2004, p. 41). Today, this social practice has been supplemented by and partly integrated in microblogging services such as Twitter (www.twitter.com) and social networks, for example Facebook (www.facebook.com). While traditional weblogs have the advantage of technological ownership (i.e. a weblog content management system can be installed on one’s own server) and they tend to be more elaborate than the ones in microblogs and social networks, for example microblogging sites add additional control in the visibility of blog postings for selected friends, contact networks and communities. Compared to online forums, which are collaboratively attributed to a group of people, both weblogs and microblogging social networks are spaces with increased personal accountability. In addition, the informal nature of weblogs has seen some change. In educational contexts, for example, weblogs are considered to be a part of a Personal Learning Environment (Attwell,

2007) and are increasingly being used as a tool for facilitating self-regulated, student-centred and reflective learning (Robertson, 2011; Sim & Hew, 2010).

Specific Properties of Blogging for Coping with Stress

Blogging includes writing blog posts, reading blog posts of others, receiving and writing comments (Deng & Yuen, 2011). Compared to traditional pen-and-paper journals, weblogs offer a number of additional possibilities. Digital text entries can be saved, reopened and edited and digital images and multimedia files can be embedded in blog postings. Blogs can be written for different audiences and with different visibility options. Entries can be either private or password-protected for a specific audience or completely open to the web. They can be written individually or collaboratively. When public, blogs provides bloggers with a sense of writing for an audience and giving readers the opportunity to add commentaries next to the original posting or reacting within their own weblog by adding a *trackback* link. As digital media with the possibility of a worldwide audience and the same time, if desired, a relative anonymity, weblogs can reduce constraints that hinder individuals from communicating stressful events by offering a safe setting with which people are better able to share inner thoughts and feelings (Caplan & Turner, 2007; Rains, 2013; Suler, 2004). This opens up new possibilities for social support, which can take the form of emotion oriented empathetic comments (e.g. expressing solidarity, understanding or encouragement) or problem oriented comments (e.g. additional information, alternative explanations, possible solutions) (Caplan & Turner, 2007). It needs to be investigated whether the feeling of social support is limited to comments on writers own blogs or whether it extends to other blog entries and comments in the blogosphere, thus creating a shared online community. If and how coping practices differ between blogs and Internet discussion forums seems not quite clear yet (Salvolainen, 2011). In contrast with online-forums or mailing lists that are commonly used by online support groups (Eysenbach, Powell, Englesakis, Rizo, & Stern, 2004; Rochlen, Zack, & Speyer, 2004; Wright, 1999), weblogs differ in their personal ownership and chronological journaling structure. Finally, apart from the obvious potentials, there are also a number of dangers and pitfalls that should be taken into account (Debatin, Lovejoy, Horn, & Hughes, 2009; Heilferty, 2009; Jones, 2003). Self-disclosure on the internet poses problems of privacy that cannot easily be reversed. While those risks are primarily associated with adolescents' use of the internet (Anderson-Butcher et al., 2010; Livingstone, Haddon, Görzig, & Olafsson, 2011), some might be applicable to adults as well. With regard to stressful events, blogging can lead to an increased vulnerability of bloggers (inviting flaming, bullying, mobbing), an increased attention of the wrong sort of people who may be inclined to give problematic support and unprofessional advice (e.g. encouragement for suicide), or leading to a feeling of increased loneliness and desperation when blog posts do not receive as much feedback as expected, and even to addiction (Kuss & Griffiths, 2011). Thus, how and under which conditions weblogs unfold their positive potential for coping with stress needs to be analyzed in more detail. As more and more studies with regard to this topic emerge, this contribution aims at collecting the available evidence in a first review.

Research Questions

Today, there is no systematic overview of empirical studies regarding blogging for coping with stress to our knowledge. By focusing on the concepts of "stress" and "coping" (in contrast to more specific concepts such as "illness", "therapy" or "trauma"), we seek to find evidence for rather informal and low-threshold applications of weblogs to alleviate psychological distress. Previous reviews in related fields of study, such as the effectiveness of online support groups do not include blogs (Eysenbach et al., 2004) or they focus on rather narrow fields of application (e.g. the professional opportunities of illness related weblogs for nursing; Heilferty, 2009). By conducting a systematic review, we try to answer the following questions:

What are the main benefits and risks of blogging as a self-initiated strategy for coping with stress?

What are promising conditions for the employment of blogging as a mandated strategy for stress reduction in institutional (i.e. therapeutic or educational) settings?

Methods

For a systematic review of existing empirical studies, we basically followed the guidelines proposed by Petticrew and Roberts (2006). We selected a number of key databases in the field of education, psychology and medicine and searched them systematically with a predefined number and combination of keywords. The results were narrowed down by specific inclusion and exclusion criteria. As there were very few studies with rigorous experimental design, conduction of a proper meta-analysis was not possible.

Instead, we produce a descriptive tabulated synopsis and compiled the main findings in form of a narrative overview.

Selection of Databases

We selected the following key databases for our search: ERIC (www.eric.ed.gov), PILOTS (<http://search.proquest.com/pilots>), PsycINFO (www.apa.org/psycinfo), MEDLINE/PubMed (<http://www.ncbi.nlm.nih.gov/pubmed>), Thomson Reuters Web of Science (www.webofknowledge.com), Google Scholar (www.scholar.google.com) and the German FIS Bildung (www.fachportal-paedagogik.de). These databases cover the Areas of Education (ERIC, FIS), Psychology (PILOTS, PsycINFO), Medicine (PubMed) and general scientific literature (Google Scholar, WoS).

Formulating Search Queries

The following initial search terms were used: "weblog*" AND "stress", "weblog*" AND "coping", "blog*" AND "stress", "blog*" AND "coping". For the search in GoogleScholar we applied a slightly different search query: "weblog*", "blog*", "stress", "coping". These search terms are purposefully narrow as they do not explicitly cover blogging in the context of "therapy", "illness", "trauma", "posttraumatic stress", "health" or other terms, that might be interrelated. Thus, it has to be pointed out, that the review is limited to studies integrating the concepts of general "stress" and "coping". The search was conducted between October 21, 2013 and October 24, 2013.

Application of Inclusion/Exclusion Criteria

The search yielded in a sum of 448 results that were examined and checked for inclusion criteria. We included (a) empirical studies (both qualitative and quantitative) that have been (b) published in journals, in books or as a doctoral thesis with a focus on (c) the use of weblogs (defined as a chronologically structured personal website, including personal sites on social networks but excluding exchange in online forums), d) particularly for coping with stress and psychological distress, e) with changes in coping behavior, stress levels, resilience or well-being as outcome variable, f) published in English or German. These criteria also excluded studies which used weblogs only as a research method or as a diagnostic tool (e.g. by computerized textual analysis). After eliminating double appearances, 17 articles of the consolidated list met the inclusion criteria for a review. The inclusion criteria were independently judged by two persons. Deviations in judgment were discussed until a joint decision was reached.

Tabulated Analysis

For our tabulated analysis we grouped the studies into one of three distinct categories:

A) *Self-initiated general-purpose blogging*. These studies investigate the general reasons and effects of weblog writing without focusing on specific topics or types of bloggers. In these studies, coping with stress is reported to be among the reasons for or the effects of blogging.

B) *Self-initiated problem-specific blogging*. These studies focus on a specific type of distress and investigate the experiences of bloggers affected by these types of problems. Although these studies seek to draw conclusions with regard to problem-specific potentials of blogging, the theoretical foundations with respect to stress and blogging remain comparable.

C) *Mandated problem-specific blogging*. These studies investigate the use of blogging for coping with stress when it is mandated in a formal context. In contrast to the other types, blogging is requested or encouraged by a therapist, educator or other representative of an institution.

Within each category we sorted the studies alphabetically and cross-tabulated a brief description of every study's aim, sample, methods and results. This provides an overview of the main findings. Based on these descriptions, we draw conclusions with regard to our research questions.

Results

An overview of the 17 reviewed studies is presented in the following chapters. The presentation is grouped according to the three distinct categories outlined above. At a glance, it can be noted that the

large majority of 16 studies deal with self-initiated blogging while mandated blogging has only been investigated in one study. Within the studies on self-initiated blogging, seven studies focus on stress-related effects of general-purpose blogging while nine studies address the effects of blogging practices related to specific problems.

Self-Initiated General-Purpose Blogging for Coping with Stress

Table 1 presents an overview of seven studies investigating psychological characteristics of voluntary bloggers and their reasons for blogging. Studies differ greatly in their design, comparing practicing bloggers and non-bloggers [A1], intending bloggers with non-bloggers [A2], therapeutic bloggers and other types of bloggers [A3], bloggers with higher or lower levels of disclosure [A4, A6], general reasons for blogging in a sample of respondents [A5] or a single case study [A7]. Studies in this section are mainly based on questionnaire data [A1, A2, A3, A4, A6], to lesser degree on content analysis [A4, A5] or qualitative methods in a single case study [A7].

Table 1. Tabulated Description of Studies Focusing on Self-Initiated General-Purpose Blogging for Coping with Stress.

[Index] Reference	Study aims and sample	Methods	Results
[A1] Baker & Moore (2008a)	The study examines psychosocial differences between bloggers and non-bloggers over time (N=58 new MySpace users who are grouped regarding to the regularity of their postings).	Questionnaire data were collected at two points in time over a period of two months. Group differences were analyzed using repeated measures ANOVA.	Social integration, reliable alliance, and friendship satisfaction were reported to be significantly higher for bloggers than for non-bloggers. Bloggers further experienced increased social support. However, regarding direct effects on stress levels, there were no significant differences between groups over time.
[A2] Baker & Moore (2008b)	The study explores the interrelation of the intention of new subscribers to blog in combination with other social and psychological variables such as stress, among others (N=134 new MySpace users).	Questionnaire data were analyzed using independent T-tests to check differences between intending bloggers and non-bloggers on numerous dependent variables.	Intending bloggers were less satisfied with their social integration and the number of online and face-to-face friends. In addition, they showed higher scores for psychological distress and a tendency towards self-blame and venting as coping strategies.
[A3] Baker & Moore (2011)	The purpose of the study is to create a 16-item Personal Blogging Style Scale (PBSS) to measure different reasons for blogging, among those: therapeutic blogging (N=182 experienced bloggers on MySpace).	A factor analysis was conducted in order to 'validate' this instrument with four subscales: Therapeutic blogging, Self-Censoring Blogging, Connected Blogging and Substitution Blogging. Correlations with several covariates were also computed.	Persons with a tendency to therapeutic blogging showed less satisfaction with friendships, higher levels of depression, anxiety and stress, but also the prevalence of various coping mechanisms. When blogging in a connected fashion, this was found beneficial for coping and stress reduction.
[A4] Bronstein (2013)	The study explores self-presentation and self-disclosure in personal blogs. (N=90 personal blogs of Latin American bloggers).	Content analysis of weblogs was combined with descriptive statistics of questionnaire data.	Blogging serves different needs. A majority of bloggers showed at least some degree of personal self-disclosure. When asked about reasons for blogging, some participants described blogging as an "X-ray of my life", for "achieving catharsis", "like a therapy",

			while others highlighted other purposes more closely related to leisure or other everyday activities. For most bloggers, publishing a blog posting leads to positive feelings like being satisfied.
[A5] Fullwood, Sheehan, & Nicholls (2009)	A sample of N=120 MySpace blogs were examined to identify trends in purpose, level of language formality, more or less positive tone, requests for feedback and use of emoticons. These aspects were compared across bloggers' sex and age categories.	A weblog content analysis was conducted. Further, to analyze group differences, Chi-Square tests were computed.	The most common motivations for blogging appeared to be writing a personal diary and to use it as a means for emotional venting. This was especially true for bloggers above the age of 50. The study concludes that blogging might be an effective way of coping, especially for people with difficulties in face-to-face interaction.
[A6] Ko & Pu (2009)	The study examines the impact of bloggers' self-disclosure on their resilience (N=226).	Questionnaire data were collected and analyzed using correlation analysis and structural equation modeling (SEM).	Nearly 60% of participants blog about stressful life events. Higher levels of self-disclosure in weblogs showed positive interrelations with bloggers' social connections, their self-understanding, helpful feedback, and levels of resilience when dealing with stressful situations.
[A7] Tan (2008)	The case study of a single blogger examines the potentials of blogging for self-therapy purposes.	Qualitative interviews and a narrative portraiture of the blogger were conducted.	Blogging supported self-reflection and cathartic expression, creating an online sounding board and maintaining relationships with readers. Generalized, weblogs were regarded as an effective coping tool for people predisposed to writing.

Self-Initiated Problem-Specific Blogging for Coping with Stress

Table 2 presents studies focusing on one particular type of problem-related weblogs such as stress in medical education [B1, B3], child loss [B2], disease [B4, B8], child adoption [B5], childbirth and infant care [B6] and eating disorders [B7, B9]. Not only the topics are diverse, but also the research methodology. Especially content analysis of blog postings seems to be a prevalent method in these kinds of studies [B1, B2, B4, B5, B7, B8], partially complimented with in-depth interviews [B5, B7, B9]. Only two of these studies compared bloggers with non-bloggers using larger samples and quantitative measures [B3, B6].

Mandated Problem-Specific Blogging for Coping with Stress

Only one study [C1] has been found to employ mandated blogging in order to cope with stress (table 3). It seems that in the field of "stress" and "coping" mandated blogging is still uncommon.

Table 2. Tabulated Description of Studies Focusing on Self-Initiated Problem-Specific Blogging for Coping with Stress.

[Index] Reference	Study aims and sample	Methods	Results
[B1] Abdo, Pashnyak, & Dennen (2011)	The study examines the use of blogs during medical school and residency training (N=30 weblogs of medical students).	Qualitative content analysis of weblogs and comments	Weblogs are described as one of the “coping mechanisms to survive the difficult years of medical school and residency training”. After work-life balance, stress is one of the major topics in about one third of student blogs. Students profit most from writing weblogs when communicating anonymously and thus openly sharing experiences and cases with peers in order to support each other. The study found high levels of social interaction, with the large majority being supportive or positive.
[B2] DeGroot & Carmack (2013)	Case study of a single mother who lost her children. The study analyzed on how the mother expresses parental grief through her blog.	The instrumental case study seeks to test the theoretical validity of established phases of parental grief by applying them to the weblog content analysis and judging their fit.	The blog showed the different stages of grief as expected from the literature. However, the computer-mediated nature of blogging was seen as a factor for an even more genuine expression of emotions. The weblog generated a broad range of social support while at the same time offering protection by relative anonymity and the asynchronous nature of the communication. Thus, blogging can blur the lines in the social conventions of how severe stress such as grief is dealt with privately and publicly.
[B3] Frame (2008)	The study seeks to examine differences in situational stress and job satisfaction between resident assistants writing online journals ($n=139$) and resident assistants who are not keeping these kind of journals ($n=646$).	To check for group differences, data from an online questionnaire including a 50- item stress inventory and several questions on blogging were analyzed using t-test, ANOVA, and ANCOVA.	Online journal keepers reported higher levels of situational stress resulting from professional changes in personal lifestyles than non-journal keepers.
[B4] Keim-Malpass & Steeves (2012)	The study explores why young women with cancer write weblogs ($N=16$).	Weblog postings were analyzed using ethnographic techniques and qualitative content analysis.	Blogs offer a platform to express emotions, exchange information and receive social support. Thus, they help bloggers to better understand their own emotions and psychological needs. Weblog writing is described as form of ‘emotional catharsis’.
[B5] Laughery Carson (2013)	The study investigates the benefit of blogging for prospective adoptive parents. For this purpose the qualitative study compares bloggers ($n=4$) and non-bloggers ($n=5$).	Qualitative interviews, field notes, blogs entries and related artifacts were analyzed using approaches derived from phenomenology and grounded theory.	Blogs offer a platform for multiple ways of coping with stressful problems during the process of adopting a child. They are employed for adaptive storytelling and meaning making, emotion processing, community seeking and within this community to seek and gain information. Thus, the blogosphere complements more traditional support networks. By telling their stories, bloggers became examples for other parents following the same road.
[B6] McDaniel, Coyne, & Holmes (2012)	The study examines aspects of well-being of first-time mothers	Self-reported frequency of blogging activity and personal well-being	The frequency of blog postings predicted feelings of connection and the perceptions of social support, which in turn increased

	depending on their use of weblogs and social networks ($N=157$).	responses were recorded using an online questionnaire. Data were analyzed using correlations and structural equation modelling (SEM).	maternal well-being and reduced parental stress.
[B7] Sanford (2010)	The study examines the use of weight loss blogs of morbidly obese people ($N=50$).	Weblog content, open-ended questionnaires and follow-up interviews were analyzed using grounded theory methods.	With regard to obesity-related stress, blogging helped through social support in the following four ways: by receiving empathy by others, by means of ensuring accountability to readers; by providing opportunities for venting and advice seeking; and by receiving validation for weight losses.
[B8] Strand (2012)	The study explores blogging as a tool to cope with the highly stigmatized disease HIV ($N=6$).	Qualitative analysis of weblog content.	Blogging is seen as an effective tool for coping with the huge psychological stress HIV patients often face. Content analysis shows weblogs as potentially effective method for self-administered therapy. The persistence of the blog activities over time has been interpreted as proof of its benefit for coping.
[B9] Yeshua-Katz & Martins (2013)	Bloggers with eating disorders ($N=33$) were interviewed to investigate their motivation, benefits and drawbacks of blogging.	Qualitative interviews were conducted and analyzed using grounded theory methods.	Blogging was considered as an effective way to cope with a stigmatized illness by means of self-expression. Participants described blogging as a cathartic experience; they also appreciated the social-support from readers and other bloggers as stress relieving. Next to the potentials, some drawbacks were evident such as fear of disclosure, encouragement to persist with eating disorders as well as being bullied.

Table 3. Tabulated Description of Studies Focusing on Mandated Problem-Specific Blogging for Coping with Stress.

[Index] Reference	Study aims and sample	Methods	Results
[C1] Boniel-Nissim & Barak (2013)	The study investigates the value of blogging for adolescents who experience social-emotional difficulties ($N=161$).	In a field experiment, participants were assigned either to one of four blogging groups (pre-structure/unstructured, open/closed to responses), a group writing personal diaries on a computer or to a non-treatment control group. Analyses are based on pretest, posttest and follow-up questionnaire data as well as expert ratings of weblog content (MANOVA/ANOVA on scores and gains).	Blogging led to a significant decrease of distress levels compared to the PC writing group and the control group. Highest improvements in psychological well-being were achieved when blogs were pre-structured and when blogs were open to responses and feedback.

Overall Observations

Overall, the reviewed literature seems to confirm that blogging might be a suitable tool for coping with stressful situations. Results from all three types of studies highlight the benefits of blogging for emotion focused coping, in terms of emotional venting and catharsis through self-expression [studies A2, A4, A5, A7, B4, B5, B7, B8, B9, C1]. In addition, receiving empathetic comments and reading weblogs of others creates a feeling of being understood and supported by a community [A1, A4, A6, B2, B4, B6, B7, B9, C1]. In a similar manner, problem focused coping through blogging is rarely described as an individual undertaking, but as a process of sharing information, providing and receiving tips and tricks, reporting on successes and failures and getting feedback from others [A4, A7, B1, B4, B5, B7, B9]. Only three studies seem to report negative differences, i.e. that bloggers are more stressed than non-bloggers [A2, A3, B3]. Since these studies are not longitudinal, it remains unclear whether this is the cause or an effect of the blogging activity. Some studies also report specific drawbacks and risks, such as waste of time, increased competitiveness with other bloggers, unwanted emotions and lying for better self-presentation [B5, B9]. Two studies reported inappropriate blog postings and aggressive comments [B3, B9]. Other studies mention the potential risks of disclosing too much personal information which can be avoided to a certain degree by blogging anonymously [A4, B9]. Anonymization is more difficult when blogging is done via social networks, however [B6]. Even though writing publicly about private matters might generally feel unusual at first, the amount of social attention received seem to outweigh these risks [A7, B2]. One study reports a risk of being encouraged by blogging to continue to be a member of a suffering community instead of finding a solution [B9].

Very few variables moderating or mediating the (successful) usage of weblogs have been investigated or even reported, so far. At least one study [A7] reports that persons who are predisposed to writing are especially suited to blog, but apart from that, studies did seldom examine differential effects. In addition, we did not find comparisons between the effects of weblogs and other forms of reflection and exchange for coping so far. Also, the interplay of weblog writing and other forms of coping activities has not been described in any detail. Finally, there are no studies in this review dealing with the question of how blogging can be purposefully used in therapeutic or educational settings. Only two studies investigate the use of blogs in formal educational or professional settings, one coming from the field of medical education [B1], one from the broader context of higher education [B3]. All others investigate the use of blogs in private lives.

Looking closer at the methods used in these studies, some potential limitations can be pointed out. The design of most studies is descriptive. Only one study employs a quasi-experimental approach [C1]. Most of the research examines naturally occurring blogging practices in stressful situations. This is known to lead to high face validity on the one hand, but also comes with a potential bias on the other. It can be presumed that only successful bloggers choose to maintain their blogs. Thus, most results can be seen as in-depth documentations of success stories. Unsuccessful blogging experiences are most likely harder to find as these blogs are abandoned or deleted. Sample sizes strongly vary, beginning with one single blog [A7, B2], to between six and twenty selected cases [B4, B5, B8], thirty and a hundred participants [A1, A4, B1, B7, B9] or more [A2, A3, A6, B6, C1] up to with a maximum of 750 subjects [B3]. Findings deriving from small samples ($N < 30$) are difficult to generalize. Moreover, the larger studies are consistently based on convenience samples, which are not necessarily representative. With regard to data collection and analysis, most studies rely on qualitative and interpretative methodology. Five studies are based on content analyses of existing weblogs [A5, B1, B2, B4, B8]. Others combine content analysis with interviews, open-ended questionnaires [B5, B7] or standardized questionnaires [A1, A4, C1]. Five studies exclusively work with questionnaires [A2, A3, A6, B3, B6], and two with interviews alone [A7, B9]. Content analyses of weblogs rarely document the longitudinal change of blogging practices over time. In conclusion this means that although findings are generally positive, methodological limitations of the research methods leave many questions open for future studies.

Discussion and Conclusion

The results of our review indicate that there were many instances where blogging has been documented as a powerful tool to cope with stressful situations in different fields of application. In addition to the general potential of traditional therapeutic writing, information sharing and social support as essential elements of weblogs seem to provide effective support for writers to overcome stressful situations, both in an emotion-focused and problem-focused manner. Most studies show that bloggers appreciate the open, non-stigmatizing and anonymous way that seems to be a core characteristic of the online experience. Despite these positive findings, results are not conclusive and need to be treated with caution. As there is a lack of experimental as well as longitudinal studies, observations are based on success stories and correlations might not be causal. For example, good coping strategies might not be an effect but a

prerequisite of successful blogging. Similar criticism has been put forward earlier with regard to other forms of reflective writing (O'Connell & Dymont, 2011). In contrast to studies on "writing therapy", where large numbers of experimental studies exist and writing was mandated and tested (Frattaroli, 2006; Frisina et al., 2004; Smyth, 1998), blogging does not yet seem as readily applicable for this kind of therapeutic intervention or experimental study. The reason for this might be an ethical issue. Because of the public nature of weblogs, it might be difficult for therapists or tutors to give writing assignments that require clients to go public with their problems. Although password-protected or anonymous blogging might counteract this issue, some advantages of weblogs observed in studies with successful self-initiated and public blogging might not be applicable to the same degree. While studies on "writing therapy" have gone into great detail, testing different types of writing assignments, writing frequency, feedback on writing or types of problems, research on blogging is at the very beginning and thus cannot offer such high levels of detail, so far. Instead, many studies remain anecdotal and thus preserving much of the "mystery" of previous creative writing therapy interventions (Wright & Chung, 2001). Thus, it still remains unclear how and under which conditions blogging can be successfully mandated. Research on the general use of blogging in higher education has shown that journal writing is not something that comes naturally, and it can even be considered stressful in itself (Sim & Hew, 2010). Evidence shows that blogging needs to be scaffolded by structured assignments (Berthold, Nückles, & Renkl, 2007; Boniel-Nissim & Barak, 2013; Freeman & Brett, 2012; Nückles, Hübner, & Renkl, 2012) and accompanied by affirmative coaching (Brandt, Dalum, Skov-Ettrup, & Tolstrup, 2013; Lepore, Buzaglo, Lieberman, Golant, & Davey, 2011). In addition, effects might not only come from individual blogging but from participation in a particular part of the "blogosphere" (Leggatt-Cook & Chamberlain, 2012). Not only writing own weblogs and receiving feedback from others on it, but also reading and commenting on weblogs of others might have an effect on one's well-being. How and to what extent such support can be fostered in formal settings has yet to be examined deeper. Finally, the question of how the use of weblogs can be combined with other computer-based approaches to stress reduction should be addressed (e.g. Serino et al., 2013).

The findings provided in this paper might be limited in a number of ways. Our search query with regard to "stress" and "coping" has intentionally been very narrow. As a trade-off, some studies on illness- or therapy-related blogging that do not include these keywords are missing. In addition, the technological tools and the social practice of blogging are constantly changing. In the last years, social networks and microblogs have largely taken over, and what can count as blogging is not exactly clear cut. As this review was rather narrative due to a lack of studies that qualify for a meta-analysis, many statements are the result of descriptions and interpretations rather than measurements. Furthermore, findings must be read with care because they are mainly based on research methodology documenting successful practices and not providing much insight on possible drawbacks and risks. Future studies should thus also include questions regarding the limitations and risks of this approach.

In conclusion, for people voluntarily choosing to write a weblog, this new approach combines the known potentials of traditional journaling such as emotional venting and the cognitive reframing of problems in new narrations with the new potentials of writing for an online community and receiving support. Blogging can be done with different degrees of anonymity, so bloggers are able to create a personalized space where they can feel comfortable to disclose their thoughts and feelings. Findings from studies on general purpose blogging suggest that coping with stress ranks among the main reasons for blogging. In studies focusing on bloggers with specific problems, voluntary bloggers reported weblogs to be an effective means of stress reduction. However, this finding might suffer from a confirmation bias. There are still too few experimental studies to conclude whether this approach can be used in mandated settings. Although the general hype around the blogosphere is vanishing and blogging practices are becoming more diverse with the prevalence of social networks, questions regarding specific uses for special purposes such as coping continue to be of high relevance.

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