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Abstract

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Reference

VON ARX, Martina Rebecca, et al. “We Won't Retire Without Skeletons in the Closet”: Healthcare-Related Regrets Among Physicians and Nurses in German-Speaking Swiss Hospitals. Qualitative Health Research, 2018

PMID: 29945491
DOI: 10.1177/1049732318782434
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Paper accepted for publication in Qualitative Health Research (June 26th 2018): http://journals.sagepub.com/doi/10.1177/1049732318782434

“We won’t retire without skeletons in the closet”: Healthcare-related Regrets among Physicians and Nurses in German-speaking Swiss Hospitals

Martina von Arx1,2, Stéphane Cullati1,2, Ralph E. Schmidt1,3, Silvia Richner4, Rainer Kraehenmann3, Boris Cheval1,2, Thomas Agoritsas2,5, Pierre Chopard1,2, Claudine Burton-Jeangros1, Delphine S. Courvoisier1,2

1University of Geneva, Geneva, Switzerland
2University Hospitals of Geneva, Geneva, Switzerland
3University of Zurich, Zurich, Switzerland
4Triemli Municipal Hospital, Zurich, Switzerland
5McMaster University, Hamilton, Ontario, Canada

Corresponding author: Martina von Arx, Quality of Care Unit, University Hospitals of Geneva, Rue Gabrielle-Perret-Gentil 4, CH-1211 Geneva 14, Switzerland, phone +41-22-372 9014, fax 41-22-372 9016, martinarebecca.vonarx@gmail.com
Abstract

Physicians and nurses are expected to systematically provide high-quality healthcare in a context marked by complexity, time pressure, heavy workload, and the influence of non-clinical factors on clinical decisions. Therefore, healthcare professionals must eventually deal with unfortunate events to which regret is a typical emotional reaction. Using semi-structured interviews, eleven physicians and thirteen nurses working in two different hospitals in the German-speaking part of Switzerland reported a total of 48 healthcare-related regret experiences. Intense feelings of healthcare-related regrets had far-reaching repercussions on participants’ health, work-life balance and medical practice. Besides active compensation strategies, social capital was the most important coping resource. Receiving superiors’ support was crucial for reaffirming professional identity and helped prevent healthcare professionals from quitting their job. Findings suggest that training targeting emotional coping could be beneficial for quality of life and may ultimately lead to lower job turnover among healthcare professionals.

Keywords

Healthcare-related Regret; Healthcare Professionals; Switzerland; Coping; Work-Life Balance; Social Capital
Introduction

Patient safety is a widely discussed issue in the general population, the healthcare sector, and the research community. A survey of Swiss residents indicated that 11.4% of respondents had experienced at least one medical or medication error over a period of two years (Schwappach, 2011). Although patients expect healthcare professionals (HCPs) to always do their best at any given moment (Coulter, 2006; Douglass & Sheets, 2000), HCPs inevitably make medical errors or handle some situations in an inappropriate manner (Goldberg, Kuhn, Andrew, & Thomas, 2002; Paget, 1988; Waring, 2005; White et al., 2008). If a clinical decision results in an unfortunate outcome, regret is a frequent emotional response (Courvoisier, Merglen, & Agoritsas, 2013). Among other types of emotional strain related to providing healthcare, studies documented various negative health consequences for HCPs associated with involuntarily caused patient harm, such as anxiety (Waterman et al., 2007), guilt (Schroder, la Cour, Jorgensen, Lamont, & Hvidt, 2017), self-doubt (Sirriyeh, Lawton, Gardner, & Armitage, 2010), or sleep problems (Courvoisier, Agoritsas, Perneger, Schmidt, & Cullati, 2011). Interestingly, some HCPs reported suffering even after situations that were not linked to an obvious medical error (Courvoisier et al., 2011), like inappropriate care (Piers et al., 2011) and loss of control over care (Shapiro, Astin, Shapiro, Robitshek, & Shapiro, 2011), both resulting in stress of conscience (Glasberg, Eriksson, & Norberg, 2008). Not all HCPs are able to cope with unfortunate events and their consequences in an effective way (Goldberg et al., 2002), thus, healthcare-related regret can influence subsequent clinical decisions and sick leave (Cullati et
HEALTHCARE-RELATED REGRETS AMONG PHYSICIANS AND NURSES  4

al., 2017; Wolf & Zuzelo, 2006). To date, only a few studies investigated HCPs’ experiences with healthcare-related regrets and associated coping strategies (Cheval et al., 2018; Courvoisier et al., 2011; Courvoisier et al., 2013; Cullati et al., 2017; Schmidt et al., 2015; Wilson, Ronneklev-Kelly, & Pawlik, 2017).

The aim of this article is to explore regret experiences related to patient care among physicians and nurses in order to (1) uncover the ways in which they deal with these experiences and (2) assess the impact of these experiences on their well-being and professional practice.

Theoretical background

Providing Healthcare in an Error-prone Environment

Providing high-quality healthcare to patients necessitates safety, timeliness, patient-centeredness and efficiency (Institute of Medicine, 2001) in an institutional context prone to error (Donchin et al., 2003; Scott, 2009). The report of the Institute of Medicine about patient safety in the United States (Kohn, Corrigan, & Donaldson, 2000) initiated a discussion about the major causes of medical errors. Context-related factors such as time pressure, heavy workload, and a complex and therefore unpredictable environment, as well as individual factors, such as stress intolerance, significantly impact everyday performance (Banja, 2010; Lenow, Constantino, Daw, & Phelps, 2017; Scott, 2009; Thorne, Konikoff, Brown, & Albersheim, 2018). Instead of blaming the individual professional, a cultural shift emerged towards a safety culture encouraging disclosure and learning, thereby acknowledging the
This paradigm assumes that medical errors are rarely due to bad intentions but arise from the features of high-risk environments (Banja, 2010; Woodward et al., 2009). With the objective of improving patient safety through a systemic approach, risk management, development of safety procedures, and incident reporting systems have been thriving in recent years (Hale & Borys, 2013; Olsen et al., 2007; Singer & Vogus, 2013).

However, the hospital environment will never become a fail-safe institution due to its inherent organizational characteristics and human fallibility (Reason, 1995; Schroder et al., 2017; West, 2000). Complex organizations like hospitals are subject to an ever-increasing specialization, which augments the risk of communication problems between HCPs (Vaughan, 1996; West, 2000). Given that time and knowledge are limited, decisions tend to be reflex-like (Djulbegovic, Hozo, Beckstead, Tsalatsanis, & Pauker, 2012; Zinn, 2009). In addition, there is a constantly growing pressure on HCPs to incorporate economic considerations into their clinical management plans (Hajjaj, Salek, Basra, & Finlay, 2010). For example, there might be a risk in high-cost intensive care units to prematurely discharge patients, which could be associated with increased mortality rate. Additionally, HCPs do not always conform to implemented safety rules. Over time, this behavior can result in a process of habituation and an ongoing socialization of newcomers, thus leading to the institutionalization and normalization of improper practices (Banja, 2010; Vaughan, 1999; West, 2000). Typically, HCPs justify such behavior with the argument that they act in the best interest of their patients (Banja, 2010;
Although they may be conscious of breaking rules or even brazenly ignoring healthcare standards, it may make sense from their point of view within a given setting (Barach & Phelps, 2013; Weick, 1993).

If a clinical decision leads to an adverse outcome, a blame-free culture will induce a learning process to improve healthcare quality on an individual as well as on an institutional level. Nonetheless, individuals can feel responsible for the unfortunate event and regret the bad outcome (Collins, Block, Arnold, & Christakis, 2009; Woodward et al., 2009). With the increase of life expectancy in the general population and of the number of patients with multimorbidity and chronic diseases (Marengoni et al., 2011; McPhail, 2016; Swiss Federal Statistical Office, 2016; World Health Organization, 2011), the number of complex medical situations will become more frequent, consequently inducing a higher incidence of regretted clinical decisions or interventions. Against this backdrop, it is astonishing how little is known about the experience of regret among HCPs.

**Definition of Regret and Regret Management**

*Regret* is defined as the feeling that occurs when one believes that one should or could have done better or behaved differently in a given patient-care situation (Courvoisier et al., 2011; Zeelenberg & Pieters, 2007). The realization that a situation turned out wrong as well as the intention to go back in time to undo what happened involves both guilt and regret. As Zeelenberg and Breugelmans (2008) point out, the emotion of regret refers to a broader variety of situations than guilt. In particular, regret is tightly related to decision-making (Zeelenberg &
HEALTHCARE-RELATED REGRETS AMONG PHYSICIANS AND NURSES

Taking into account that unfortunate events are not necessarily associated with a medical error but always with clinical decision-making, the emotion of regret might better capture these feelings than guilt (Zeelenberg & Breugelmans, 2008).

Regret-coping Strategies and Social Capital as Resource

Although it is known that healthcare-related regrets can seriously impact personal health and daily medical work (Courvoisier et al., 2011; Cullati et al., 2017; Piers et al., 2011; Scott et al., 2014), only a few researchers have investigated specific regret-coping strategies. Along the lines of the traditional typology of coping with stressful events, problem-focused strategies and emotion-focused strategies can be distinguished (Biggs, Brough, & Drummond, 2017; Lazarus & Folkman, 1984). Earlier studies on coping with unfortunate events by physicians and nurses rarely applied this dichotomy. Rather, they emphasized components such as reappraisal and social support from peers and relatives (Christensen, Levinson, & Dunn, 1992; Courvoisier et al., 2011; Schroder et al., 2017; Scott et al., 2009; Wu, 2000). Other researchers have pointed out that physicians usually deal with unfortunate events in a defensive way, without seeking any help, and manage emerging strains individually or by blaming the system, and sometimes other HCPs, for what happened (Christensen et al., 1992; Newman, 1996; Wu, 1991). Based on these findings it is assumed that individual supportive social relationships encourage effective coping with healthcare-related regrets. These relational resources are conceptualized as a form of social capital. Considering that healthcare-related regrets mostly relate to sensitive experiences, such a social capital must consist of reciprocally trustworthy relationships (Boyas
These attributes are indeed key features of social capital, although the concept itself has definition of various complexity (Adler & Kwon, 2002; Stromgren, Eriksson, Bergman, & Dellve, 2016). In this study, social capital represents all relational resources of professional and private nature through which personal support can be mobilized (Bourdieu & Wacquant, 1992; Rostila, 2011). Employment-based social capital in healthcare was shown to positively influence job satisfaction (Ommen et al., 2009; Stromgren et al., 2016) and reduce burnout rates (Eliacin et al., 2018). However, these studies neglected the social capital accessible in the private sphere that may be perceived as a helpful and effective regret-coping resource.

Data and Methods

Participants and Setting

The study was conducted in two major hospitals in Zurich, Switzerland from May to September 2016. Hospital 1 provides basic and intensive medical care, whereas hospital 2 offers psychiatric and psychotherapeutic treatments (Table 1). We attempted to include similar numbers of physicians and nurses. Out of 48 HCPs contacted initially, 24 (11 physicians, 13 nurses) agreed to participate, 2 refused and 22 did not answer our email invitation. HCPs represented different types of clinical specialty: internal medicine (N=8), psychiatry (N=6), oncology (N=2), rheumatology (N=2), intensive care (N=2), emergency care (N=1), visceral surgery (N=1), quality of care (N=1) and pain nurse (N=1). Further characteristics of participants are described in Table 1.
Qualitative Interviews

Face-to-face semi-structured interviews were conducted in Swiss-German dialect (N=15) and in German (N=9) by a sociologist having no previous relations to the mentioned hospitals. The fact that the interviewer wasn’t a HCP was helpful in establishing a confidential conversation. Participants were first asked to spontaneously describe their most intense feeling of regret following a patient-care situation that they remembered when looking back on their whole career. If they had difficulties to refer to a specific situation, the interviewer defined regret as the feeling that occurs when one believes that one should or could have done better or behaved differently in a given patient-care situation (Zeelenberg & Pieters, 2007). More specific questions followed regarding the healthcare-related regret’s consequences on HCPs’ own health, its impact on their private and professional life, as well as the way HCPs coped with this regret experience. Interviewees were asked to verbally rate regret intensity at the time of its occurrence and at the time of the interview on a scale ranging from 0 (no regret) to 10 (very strong) to assess the evolution of feelings over time and the potential intensity differences between situations with and without error. The whole procedure was repeated for a second healthcare-related regret. Interviewees were asked to choose and discuss a situation that differed from the first one in terms of its relatedness to a medical error. Average interview duration was about 51 minutes (range 34-73). All interviews were recorded, transcribed verbatim, and anonymized.
Data Analysis

Qualitative analysis was performed by coding all interview transcripts focusing on the specific experiences and consequences of the reported healthcare-related regrets. The initial list of codes was based on the previous study of Courvoisier et al. (2011). Following a pre-analysis of five randomly selected interviews, the list of codes and the corresponding coding rules were discussed within the research team and inductively adapted to the present data set (Table S1).

Using Atlas.ti software (version 7.5.17) MV coded all interviews. Coding was then cross-checked by two physicians and a psychologist (SR, RK, RES), to assess the internal validity of the coding procedure. When coding discrepancies were identified, agreement on code application was reached by consensus building between coders. By reading the summary of each interview, two physicians with expertise in quality of care (PC, TA) additionally assessed independently whether the described healthcare-related regrets were associated with a medical error, a potential medical error, or no medical error. Their independent point of views served as an external evaluation to render the interpretation of the healthcare-related regrets and their perceived association with medical errors more accurate.

Research Ethics

The study was approved by the Research Ethics Committee of the Canton of Geneva. Participants’ informed consent was obtained in writing at the beginning of every interview.
Findings

Characteristics of Healthcare-related Regret Experiences and Health Consequences

Most participants could easily identify one major healthcare-related regret in their work life. When asked for another healthcare-related regret, it took them longer to think of a second one. In total, 48 healthcare-related regrets were reported (Table S2). Almost all respondents reported two personally important healthcare-related regrets. Healthcare-related regret mean intensity at the time of the event was 7.3 (on a scale of 0-10) for both the first (range 3.5-10; N=23) and the second healthcare-related regret (range 2-10; N=20). Mean intensity at the time of the interview was 3.0 for the first (range 0-8.5, N=23), and 1.1 for the second healthcare-related regret (range 0-9, N=21). Subjective healthcare-related regret intensities at the time of occurrence were similar for situations that were unrelated to a medical error (mean 6.7, range 2-10, N=23) and for those related to a potential medical error (mean 7.0, range 3.5-10, N=7), while they were slightly higher for situations related to a medical error (mean 8.6, range 4-10, N=18). Detailed ratings of healthcare-related regrets are summarized in Table 2. Decrease of regret intensity over time (difference between time of event and time of interview) was more important in situations related to a medical error compared to situations not related to a medical error.

The time of occurrence of the reported healthcare-related regrets ranged from 30 years, to two days prior to the interview. Irrespective of the elapsed time, participants remembered their healthcare-related regrets well and their reports were richly detailed. 23 healthcare-related regrets were not associated with a medical error according to the corresponding HCPs, which
was largely confirmed by experts in quality of care. Although the interviewer tried to obtain two different healthcare-related regrets, one associated with a medical error and one without, only 9 HCPs could identify a personally relevant example for each kind of regret. 8 interviewees exclusively reported regrets associated with a medical error. The other 7 HCPs only mentioned regrets associated with inappropriate decisions on a relational level which they considered as being more serious than medical errors. Two types of arguments were given to explain this evaluation. First, a physician explained how her increasing professional experience had led to a different perception of the real challenges of everyday medical work:

“The longer I am on the job, the more this technical aspect takes a back seat in my view. (...) I think the general challenge is increasingly on a relational level, namely to care well for a patient. (...) I think, if you have worked for ten, twelve years, you can sail through standard situations.” (physician)

Second, most participants considered it normal that minor medical errors happen every now and then. In a long-term perspective, it seemed to be common sense that everybody eventually has to deal with at least one major unfortunate event. The broad acceptance of the inevitable character of medical errors was put in a nutshell by a physician:

“We won’t retire without having skeletons in the closet. (...) It is simply the case that for a certain percentage it won’t end well. (...) For certain things, you know from the beginning that all you can do is try.” (physician)
This quote shows how potentially negative consequences in a clinical environment are a part of this physician’s daily routine. Another example is given by a nurse who twice disregarded the same safety rule:

“There is the rule of the ‘Five Rights of Medication Safety’: Right Drug, Right Patient, Right Time and so on. At that moment, I committed a blunder. I didn’t check for everything. (...) I am convinced that these kinds of errors happen dozens of times. (...) Still, I once again ignored one of the five key points of this procedure, nobody got hurt, but I incorrectly administered medicine. Mistakes happen, and I think they should be examined carefully: Why did they happen and what can I learn from them to become more proficient and to prevent such an event in the future, especially so that it has no serious consequences.” (nurse)

Both interviewees were aware that healthcare practice is prone to error, but they accepted this aspect as an inevitable part of their profession. Nevertheless, HCPs were not indifferent to this circumstance. On the contrary, healthcare-related regrets generally led to increased vigilance among HCPs, particularly in situations that appeared to be similar to those at the source of a healthcare-related regret, no matter if the unfortunate event was associated with a medical error or not.

Furthermore, healthcare-related regrets had remarkable consequences for HCPs’ physical and mental health. Besides regret, unfortunate events evoked other feelings, especially stress. In decreasing order of frequency, further emotions stated in this context were guilt, frustration,
sadness, anger (other- and self-oriented), anxiety, injustice, humiliation, and shame. An unfortunate event in which a physician did not dare to assert herself against the authority of her superior, although she felt that several things were going wrong, illustrated these other feelings:

“I was angry with others, with my colleague [superior] who behaved like a big shot, as an all-knowing grandmaster, while we were just his puppets. But I was also angry with myself, especially because I had realized what was happening but I still didn’t make my point.” (physician)

Apart from emotional responses, healthcare-related regret was also reflected in HCPs’ physical health. The most frequent psychosomatic reactions linked to healthcare-related regrets concerned sleep loss, which was reported by more than half of the participants. This included difficulties falling asleep because of rumination, waking up in the middle of the night, having dreams about the experiences, and waking up in the morning with the event being the first thing to come to mind. Many participants specified that they usually did not suffer from sleep disturbances related to professional stress, which emphasized the powerful impact healthcare-related regret can exert on HCPs’ own health.

“The following night I slept very little, which rarely happens to me (…) and I had thoughts running through my mind in the night as well as the following morning. It really provoked a reaction.” (nurse)
Other psychosomatic consequences were, in decreasing order of frequency, absence of appetite, headache, exhaustion, muscle tensions, palpitations, feeling of sickness, and rashes. On a cognitive level, some participants reported difficulties concentrating. As stated by this physician, healthcare-related regrets can even affect physical health over a prolonged period, although symptoms may change over time:

“During the first few days, I could barely eat or drink. I was just drinking water, and even if I ate something small, I immediately felt sick. I also felt physically ill in general. I got sudden palpitations. Later on – probably also due to exhaustion – I got severe migraine-like headaches. It was really intense.” (physician)

Although not all healthcare-related regrets had such intense health consequences, mainly physicians pointed out the burdensome accumulation effect of minor regrets in the context of a constantly high workload. A physician compared this sort of burden to a backpack:

“It is as if you went hiking, and everyday your backpack gets a bit heavier. And then at some point, on Sunday or the following week, you can empty it and then things come back to mind.” (physician)

As illustrated in the citations above, healthcare-related regrets can affect HCPs’ private sphere, thus jeopardising their work-life balance.
Maintaining One’s Work-Life Balance: the Importance of the Way Home

As many of the participants described, feelings of regret and their side effects only showed up at the end of the shift or during a quiet moment, and often not until HCPs had arrived home. A physician explained how emotions overwhelmed her following an unfortunate event she regretted intensely:

“After being on duty at the emergency unit, which makes you agitated anyway, if something like this happens, I think, it gets even more intense when you go home. Here [at the hospital] you are distracted, you work and work, and when you leave you think “woah”. (…) As soon as you leave the hospital, it feels as if some sort of wave of everything that happened during the day comes crashing down on you. During the shift, you have no time to deal with it.” (physician)

To prevent daily professional experiences, such as minor healthcare-related regrets, from invading their private sphere too much, some participants consciously payed attention to mark entrance to and exit from the hospital by different rituals, as exemplified by the following quote:

“When I put my clothes into the laundry basket, an action to which I am very attentive. For me, it represents the moment at which I leave behind everything that has happened during the day. Then I cycle home. This half-hour ride is like a flowing river which refreshes my energy.” (nurse)
As stated by this nurse, the way home represented for many respondents an essential buffer zone between work and home. Regardless of the means of transport used, a half-hour commute is not perceived as wasted time, but rather viewed as an opportunity to work through the daily experiences after work.

The time spent on the way home can partly mitigate consequences of healthcare-related regrets and heavy workload in general. However, more compensation may be needed to counterbalance professional stress and specifically healthcare-related regrets. Half of the participants practiced relaxation techniques and/or sports in their leisure time. Some of them specified that exercise did not grant immediate relief, because they were still overwhelmed by feelings of regret and their side effects, but it had a positive effect in the long run. Another compensation strategy was to consume alcohol and/or cigarettes. Although HCPs were conscious that it might be a rather destructive way of coping with regret, they appreciated its relaxing effect. Furthermore, healthcare-related regrets boosted empathy in a third of the respondents either on a professional level, for example in terms of talking more often to the patient who had been involved in the healthcare-related regret, or on an individual level. A physician tried to make amends for consultations that had gone wrong by improving private relationships:

“Maybe it sounds a bit weird, but I try to compensate for it a little bit when I have other conversations, which can also be of a private nature. By being especially sensitive and sympathetic I try to make up for it.” (physician)
Various compensation strategies as well as setting boundaries between work and home in the form of rituals appeared to be important regret-coping strategies with respect to maintaining HCP’s work-life balance.

Talking about Regret – Mobilizing Social Capital

In addition to the previously described regret-coping strategies, the possibility to talk about healthcare-related regret was essential for nearly all respondents. The importance of social support is reinforced by the fact that unfortunate events usually raised major doubts about HCPs’ own medical competence. HCPs were even more affected by a loss of confidence in their own professional skills if the unfortunate event was related to an obvious medical error. As a result, some respondents thought about quitting their job because they considered themselves incapable of providing appropriate healthcare. Only because they had the support of their superiors, who helped them restore their professional identity, could HCPs carry on and continue working, as illustrated by the example of a nurse. In her early years in the intensive care unit, she set the dosage of a perfusion pump much too high. The patient only survived because the team leader realized the overdose. Despite the sympathetic reaction of all her colleagues, she continued to question herself and her professional identity. The nurse managed to overcome her regret only after a conversation arranged by two of her superiors, who had noticed that she was considering quitting the training program following this situation. Her statement illustrated how her superiors convinced her not to abandon medical work:
“They said it would be such a pity if I quit, because people who are capable of looking closely at their errors without being indifferent, are the kind of people they would like to have in the intensive care unit. What I considered to be a weakness of mine, was actually something they appreciated. (...) I think this was the key. To receive external support as a professional.” (nurse)

By reappraising her healthcare-related regret, her superiors prevented the nurse from quitting the job she enjoyed. In fact, according to most interviewees, healthcare-related regrets had no consequential impact on the orientation of their career. However, a few of them considered that their healthcare-related regret had reinforced an already existing desire for professional change at the time of the occurrence, which resulted in taking some time off from the job, opting for another specialty, or a change of workplace. Some participants pointed out that their healthcare-related regrets strengthened their desire to work part-time in order to better cope with professional stress related to regret.

To what extent the full support of superiors was a precondition, not only for preventing HCPs from quitting their jobs but also for other regret-coping strategies to take effect, is made clear by this physician:

“In general, the support of the superior was more important to me because if I hadn’t had his support it would have been worse. In this case, others [relatives] couldn’t have bailed me out either, because (...) I would have quit [the job] or would have been fired.” (physician)
Not all participants shared their healthcare-related regret with family or friends, mainly because they did not perceive the sympathy shown by their relatives as reassuring enough, considering them as outsiders to the medical field. This was well illustrated by a statement that can have a different meaning depending on the person who uses it. If the phrase “This can happen to everyone” was pronounced by a relative, it was perceived as less supportive than if it was expressed by a superior. A physician explained why he did not feel well supported by his relatives and friends after having discharged a patient who had afterwards shown aggressive behavior while leaving the psychiatric hospital:

“Of course, everybody is saying: “This can happen to everyone.” And: “These are difficult patients.” You get this sympathy somehow, but at the same time you know that it won’t help you in case of doubt. If he [the patient] messes something up, you are responsible.” (physician)

Aware that he could be found guilty for his decision, this respondent was not relieved by his relatives’ attempt to justify the unfortunate event. Whereas the role of superiors is essentially linked to reaffirming HCP’s professional identity and confidence in their medical competence, emotional support was often sought among family and friends. For those who did talk about their regret at home or with friends, two subgroups can be distinguished. HCPs belonging to the first subgroup had a partner who wasn’t familiar at all with the field of medicine. In these cases, the support was mainly just listening carefully and being sympathetic. Most of the
participants in this subgroup were at the same time seeking support from one or more of their friends who were themselves HCPs.

“Concerning long-term support, I have two or three best friends from university who have experienced similar situations, and they provide better support. For sure it is important for me to call my husband directly after the situation, just on an emotional level, but – and I’m not trying to be derogatory – he is a mathematician, the worst that can happen to him is that he programmed something incorrectly.”

(physician)

Because he was an outsider to the medical profession, this female physician did not consider her husband as supportive enough in the long run and preferred consulting with her insider friends about healthcare-related regrets.

The second subgroup is formed by HCPs who have other HCPs among their closest relatives, who may represent a beneficial resource for regret-coping, as shown for example by this physician:

“In no way, I did feel that it was somehow a throwaway remark from my father [physician], he really seemed to understand it. And what he said was sophisticated. It wasn’t just meant to be supportive, like ‘everything will be ok,’ but rather sympathetic like ‘yes, this is a difficult situation’.” (physician)
The credibility of justifying statements is only guaranteed if they come from someone who is well acquainted with the medical profession and the hospital environment.

**Discussion**

*Healthcare-related Regrets in the Context of a High-risk Environment*

All 24 interviewees described at least one healthcare-related regret. There were large differences in the subjective rates of regret intensity, probably in part due to the amount of time elapsed since the unfortunate event had happened. Hence, evaluations were influenced by effective ways of regret-coping like reappraisal.

In general, healthcare-related regrets led to increased awareness of the surrounding error-prone working conditions among all participants. Although HCPs’ increased vigilance of potentially critical circumstances might help reduce the risk of medical errors (Wolf & Zuzelo, 2006), this effect could be weakened by the fact that minor medical errors are common in everyday professional life (Benkirane et al., 2009; Garrouste-Orgeas et al., 2012; Rafter et al., 2015; Sousa, Uva, Serranheira, Nunes, & Leite, 2014). Strikingly, some of the respondents judged errors on a relational level as being worse than obviously wrong clinical decisions, for example not speaking up for a patient in front of superiors or family members. Furthermore, healthcare-related regrets linked to medical errors like an incorrect medical dosage were experienced with less intensity among these respondents. They explained wrong clinical decisions as a result of a disastrous combination of circumstances. The assumption that the bad outcome was not
caused by a single clinical decision but resulted from a process of many puzzle pieces contributing to the final unfortunate event indicates that wrong clinical decisions are somewhat accepted in hospitals (Paget, 1988; Reason, 2000).

Measures to improve healthcare quality should consider that HCPs are accustomed to a high rate of minor medical errors (often without severe consequences for the patient) and should therefore target collaboration processes to prevent a normalization of deviant practices and a lowering of healthcare quality standards (Epstein & Peters, 2009; Rafter et al., 2015; Waring et al., 2007). As shown in another qualitative study, the mentality of a blame-free patient safety culture could be more adjusted to these socio-cultural characteristics of medical work (Hoffman & Kanzaria, 2014; Waring, 2005). Additionally, the fact that most interviewees were able to remember a regret not related to a medical error and that regret intensity was almost identical in both types of regrets, emphasizes the importance of enlarging patient safety perspectives to feelings of regret induced by clinical decisions that are not linked to an actual medical error (Schroder et al., 2017).

**Regret-related Consequences and Implications on the Work-Life Balance**

Healthcare-related regrets often elicited other feelings, such as guilt and frustration, which were mostly accompanied by increased emotional stress. Several participants expressed serious psychosomatic consequences like loss of appetite or headaches. Most frequently, regret disturbed respondents’ sleep (Schmidt et al., 2015), often associated with rumination that delayed sleep onset (Schmidt & Van der Linden, 2013) and caused abrupt awakenings in the
middle of the night. Psychosomatic consequences were mainly perceived in the private sphere, because high workload and time pressure in the hospital environment usually force HCPs to maintain the functioning of their unit, thereby fostering the use of dysfunctional regret-coping strategies like thought suppression.

Our data suggest that healthcare-related regrets exacerbate pre-existing professional stress. Hence, healthcare-related regrets could intensify work-family conflicts among HCPs. As previous studies showed, organizational dimensions (e.g. overtime hours) play a decisive role in work-life balance (Lembrechts, Dekocker, Zanoni, & Pulignano, 2015; Mache et al., 2015; Simon, Kummerling, Hasselhorn, & Next-Study, 2004). Indeed, some participants emphasized that healthcare-related regrets strengthened their desire to work part-time. Further, our findings provide evidence that HCPs paid close attention to separating their private from their professional life by developing specific rituals. Another important strategy was to spend some time ruminating on the way home. Commute time thus turned out to be an important buffer zone to cope with professional stress and regret experiences (Hall & Richter, 1988; Sturges, 2012).

*Social Capital – an Essential Coping Resource*

Regret experiences were regularly associated with a profound feeling of responsibility for the bad outcome, often in combination with a deep-rooted helplessness when facing these situations. This perceived helplessness raised major doubts concerning HCPs own medical
competence among more than half of the interviewees. Subsequently, healthcare-related regrets could cause higher rates of absence and turnover among physicians and nurses.

According to many participants, their healthcare-related regrets did not affect the orientation of their career. Reasons for this could be twofold. First, the sample included only physicians and nurses who were still working with patients, thus limiting the reported experiences to HCPs who obviously did not quit their jobs after an unfortunate event. Second, continuing to work despite setbacks might be the result of a blame-free safety culture where HCPs are fully supported by their superiors. By reappraising the unfortunate event, superiors are able to reaffirm professional identity and confidence in medical work, thereby preventing HCPs from leaving their jobs. The accessibility of such social capital appears to be crucial for regret coping, and may reduce the intention to leave (Strömgren, 2017). The importance of support by sympathetic superiors might be closely related to the fact that healthcare-related regrets seriously shake the seemingly errorless nature of the medical professional identity (Coulter, 2006; Douglass & Sheets, 2000).

Coping with emotional stress resulting from destabilizing healthcare-related regrets primarily consisted in talking to family, friends and other HCPs. Talking to someone familiar to the medical context was perceived as more helpful than to outsiders who were primarily expected to be good listeners. This suggests that social capital is a decisive element in overcoming healthcare-related regrets. Therefore, hospitals should stimulate communication between superiors and subordinates because professional boundaries related to hierarchical structure risk
inhibiting effective regret-coping through reappraisal. One possible improvement in hospital care might be to implement institutionalized debriefing sessions after critical incidences, for example Balint groups (Kjeldmand & Holmstrom, 2008). A further provision could be to establish mentoring for teams and individual professionals (Gemma, Valerie, Nancy, Jane, & Alison, 2017).

**Limitations and Strengths**

The qualitative interviews provided rich data regarding HCPs’ diverse experiences of healthcare-related regrets. Still, the generalizability of the findings is limited to individuals and settings similar to our study. Further limitations concern the fact that healthcare-related regrets were narrated in retrospect, which might introduce a recall bias. However, we should point out that the variable periods between the time the unfortunate event occurred, and the time of the interview offered interesting insights into the efficacy of some specific regret-coping strategies (e.g. “time is a good healer”). Methodologically, interdisciplinary cross-checking of all interviews ensured the validity of code application.

**Conclusions and Implications**

Medical errors are common in healthcare settings, and HCPs must eventually deal with unfortunate events. This study focused on healthcare-related regrets of physicians and nurses in two major German-speaking Swiss hospitals. Findings suggest that intense healthcare-related regrets can be similarly elicited by (potential) medical errors and by inappropriate clinical
Healthcare-related regrets among physicians and nurses

decisions. Although awareness of HCPs to error-prone conditions is raised every time an unfortunate event occurs, HCPs nevertheless consider it normal that minor medical errors without noticeable consequences for the patient happen on a regular basis. Therefore, possible interventions improving patient safety should carefully examine socio-cultural aspects of HCPs’ work practice

Healthcare-related regrets were often accompanied by serious emotional reactions and psychosomatic manifestations that affected HCPs’ professional and private lives. To counterbalance negative regret-related health consequences, participants deployed various compensation strategies in their leisure time. Healthcare-related regrets seemed to aggravate the already existing heavy workload, which may intensify work-family conflicts. Though, the greatest challenge raised by healthcare-related regrets was the loss of confidence in medical competence. A crucial factor to reaffirm one’s professional identity was social support from superiors, which prevented HCPs from quitting their jobs. Having medical insiders in HCPs’ personal circles reinforced private social capital because of increased credibility concerning justifying statements. Mobilizing social capital might therefore be the most effective regret-coping strategy to foster reappraisal and learning.

Author Contribution

MV, DSC, SC, SR and RES conceived the research idea and design. All authors contributed to preparing and revising the draft. All authors read and approved the final manuscript.
Acknowledgments

The authors are grateful to all physicians and nurses who voluntarily participated in the study. Our thanks go as well to Stefan Donati for transcribing the interviews and to Dan Orsholits for proofreading the manuscript.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

This work was supported in part by the Swiss National Science Foundation (grant number 166010).
References


Table 1. Sample Characteristics of the 24 interviewees

<table>
<thead>
<tr>
<th>Sample Characteristics</th>
<th>Nurses N=13</th>
<th>Physicians N=11</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Women</td>
<td>10 (77%)</td>
<td>4 (36%)</td>
</tr>
<tr>
<td>Age: Median (range)</td>
<td>34 (28-62)</td>
<td>41 (25-59)</td>
</tr>
<tr>
<td>Professional status of nurse/physicians:</td>
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</tr>
<tr>
<td>Nurse / Residents</td>
<td>7 (54%)</td>
<td>7 (64%)</td>
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<tr>
<td>Head nurse / Senior board certified</td>
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<td>4 (36%)</td>
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<td>Hospital:</td>
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<td>Hospital 1</td>
<td>10 (77%)</td>
<td>8 (73%)</td>
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<tr>
<td>Hospital 2</td>
<td>3 (23%)</td>
<td>3 (27%)</td>
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<td>Germany</td>
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<td>5 (45%)</td>
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<tr>
<td>Years of professional experience: Median (range)</td>
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<td>5.5 (2-36)</td>
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Table 2. Rated regret intensities according to the 24 interviewees

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<th>ID</th>
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## Medical error

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**Legend:** Three situations were not rated during the interview and are not present in the table.
Supplementary Materials

Table S1. Two Main Coding Groups for Data Analysis

<table>
<thead>
<tr>
<th>Intensity and consequences (39):</th>
<th>Coping (24):</th>
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<tr>
<td>Emotions (10)</td>
<td>Cognitive strategies (8)</td>
</tr>
<tr>
<td>Cognition (8)</td>
<td>Action-oriented strategies (9)</td>
</tr>
<tr>
<td>Physical symptoms (2)</td>
<td>Social strategies (7)</td>
</tr>
<tr>
<td>External impact (3)</td>
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</tr>
<tr>
<td>Internal impact (5)</td>
<td></td>
</tr>
<tr>
<td>Impact on trajectory (3)</td>
<td></td>
</tr>
<tr>
<td>Impact on work performance (6)</td>
<td></td>
</tr>
<tr>
<td>Impact on private life (2)</td>
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</table>

Legend: between brackets the number of codes belonging to the theme is noted
Table S2. Summaries of Healthcare-related Regrets

<table>
<thead>
<tr>
<th>Healthcare-related regrets involving no medical error</th>
<th>Physicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Because it was his first patient with borderline personality disorder, a physician was very enthusiastic at the beginning of treatment. As he realized that his efforts did not have the expected effect, he became less motivated, resulting in a frustrating situation both for the patient and himself.</td>
<td></td>
</tr>
<tr>
<td>2. A patient, who had been admitted to the psychiatric clinic for the first time, was fastened to a stretcher. The care team decided to prolong the fixation until he would calm down. A physician who was in charge of the patient during the night shift disapproved of this decision because personally he preferred medication over fixation.</td>
<td></td>
</tr>
<tr>
<td>3. A physician carefully removed a large catheter from the patient’s groin to prepare him for the upcoming thrombolytic therapy. During therapy, the patient died of hemorrhage.</td>
<td></td>
</tr>
<tr>
<td>4. A physician and his team tried to find a suitable setting for a suicidal patient whose emotional condition worsened in the clinic, but who had attempted suicide after being released for the first time. When the patient was released for the second time, she committed suicide.</td>
<td></td>
</tr>
<tr>
<td>5. To treat a patient’s chronic pain in the whole body, a physician used different approaches. The therapy was of limited success because the pain had mainly psychosomatic reasons and was linked to the patient’s low socioeconomic background.</td>
<td></td>
</tr>
<tr>
<td>6. To measure arterial blood pressure, a physician decided to use an arterial catheter. However, they did not manage to place it correctly for two hours, which was very painful for the patient. Finally, the physician decided to use a blood pressure cuff.</td>
<td></td>
</tr>
<tr>
<td>7. A patient in the intensive care unit told the physician that she had lived long enough and did not wish any further treatment. During consultation with her family members, the patient was persuaded by her relatives to accept the indicated medical examination. The physician didn’t manage to convince the family of the patient’s will or to get the patient to express herself.</td>
<td></td>
</tr>
<tr>
<td>8. A physician had a conversation with relatives of a patient whose treatment was about to be stopped. Months later, the physician received a call from one of them complaining about the way in which she had communicated with them. They had felt that they were being treated like idiots.</td>
<td></td>
</tr>
<tr>
<td>9. A patient was admitted to the intensive care unit after a stroke. The care team sedated the patient and tried to wake him up several times the following three days. A physician told her superior that she did not agree with such an artificial prolongation of life, but the superior told her to be patient. A few days later, the patient started to recover.</td>
<td></td>
</tr>
<tr>
<td>10. A patient had a sudden respiratory depression and the physician did not manage to intubate the patient. She made an emergency call to her superior and other healthcare professionals. Another physician confirmed that the patient was properly intubated. The patient was transferred to the surgery ward with a suspected hemorrhage. There, they realized that the patient had suffered from insufficient oxygen supply for a while, which ultimately led to death by hypoxic brain injury.</td>
<td></td>
</tr>
</tbody>
</table>
11. At the beginning of her shift, a physician had to stop the heart-lung machine of a patient in the presence of his relatives. The physician found it difficult to accompany the relatives appropriately because she had not been responsible for this case before.

**Nurses**

1. A psychiatric nurse began to take particular interest in a patient when she realized that the rest of team could not handle his difficult behavior. Finally, she found herself caught up trying to mediate in the conflict-laden relationship between the patient and the team.

2. A psychiatric nurse took care of a newly arrived patient whose symptomatology seemed ordinary. Accordingly, he did not receive any special treatment. Soon after he said he was going for a short walk, she was told that he had committed suicide.

3. A psychiatric patient tried to commit suicide by strangulation in the clinic. Although the nurse immediately alerted the care team and the patient could be saved, the scene was burnt into his memory forever.

4. After a long stay in the psychiatric clinic, the patient’s emotional situation worsened and a transfer to another ward was repeatedly discussed. The patient was fiercely against the transfer. Finally, the care team had to resort to physical force to arrange the transfer.

5. A patient in the intensive care unit was unable to communicate verbally but repeatedly showed that he wished to stop all treatments. The care team agreed with his nonverbally expressed decision. The physician, in contrast, decided to continue the treatment, which left a nurse speechless.

6. A nurse noticed that a patient’s health in the intensive care unit deteriorated. She asked the physicians in charge several times if she could call the patient’s husband to give him the opportunity to pass by and say goodbye, but they told her to wait. Finally, the patient died under reanimation without having seen her husband again.

7. A nurse visited a patient in the evening and noticed her respiratory insufficiency, but the patient told her that she was ok. An hour later, the nurse noticed that the patient suffered from breathing problems. She immediately called a physician, who gave sedative medications. Later that night, the patient died.

8. A nurse was in charge of a cancer patient whose survival prognosis was rather bad. One day, family members came to see the patient. When the nurse entered the room, she realized that she personally knew the patient’s relatives. The situation left her confused and prevented her from openly talking about the patient’s health condition.

9. The chemotherapy of a patient was not successful. Following this, a nurse noticed that the physicians in charge did not pass by as often as usual and arrived late to meetings twice. The patient’s family relations were strained, and the nurse and other members of the care team became the target of the frustration of the family members.

10. Following a reanimation alarm, a nurse went to help. Given that the patient was transferred to the reanimation room for cardiac catheterization, a cardiac massage was not performed, although the nurse felt that it would be the right thing to do. The patient died one hour later.

11. Although a patient suffered from a bronchial carcinoma, he insisted on smoking every day. One morning, his respiratory insufficiency was so bad that he did not manage to pull himself in a wheelchair to go downstairs for a cigarette, so he asked a nurse for help. The nurse refused, and the patient died in the afternoon.
12. A patient’s treatment was reduced to a minimum to prevent artificial prolongation of life. A bit later, the patient woke up and expressed thirst. A nurse gave her something to drink, but the situation led her to doubt the decision to reduce treatment.

13. A patient with drug addiction was admitted to the hospital for the treatment of multi-resistant germs. To substitute heroin, he was given morphine. A nurse noticed that the patient became more depressed. The patient told her that he was missing the effect of heroin. Several days before being released, new multi-resistant germs were detected in his blood, and he admitted having left the hospital to buy heroin.

### Healthcare-related regrets involving a potential medical error

#### Physicians

1. A psychiatric physician evaluated a newly arrived patient as mildly depressed and amenable to treatment. When returning to work three days later, he learnt that the patient had committed suicide.

2. A physician was responsible for a patient with multimorbid diseases who suffered an inflammation, which was successfully treated. Suddenly, the patient suffered a tachycardia whose cause could not be determined. Two days later, the patient died.

3. A patient in generally bad health condition who wished no life-prolonging measures suffered a pulmonary inflammation and received morphine to alleviate breathing difficulties. After another respiratory attack, the physician gave her more morphine. The patient calmed down, but it was no longer possible to wake the patient up. The patient died the following day.

4. A patient with inflammatory symptoms was treated with antibiotics, but the cause of the inflammation could not be determined for two weeks. The physician in charge ordered to stop the antibiotics and to see the effect of it. Three days later, the patient suffered from severe abdominal pain. An intestinal perforation was diagnosed, and the patient underwent emergency surgery.

#### Nurses

1. During several weeks, a nurse was responsible for the pain management of a drug addict. Later, she was told by the care team that the patient had felt bad all along, had suffered from severe pain, and that he had not received enough reserve medication.

2. A patient reported sharp pain after a surgery removing an artificial anus. The nurse gave her a painkiller. Later, it became clear that the internal suture was torn. The patient was immediately transferred to the intensive care unit.

### Healthcare-related regrets involving a medical error

#### Physicians

1. A physician treated a patient on the basis of laboratory results without realizing that they were outdated by one month. The patient suffered a circulatory collapse, was reanimated twice and survived.

2. After a patient’s health had rapidly deteriorated in the emergency unit and a transfer to the intensive care unit was out of the question, a physician recommended the family members to pass by and say goodbye to the patient. Contrary to the physician’s prognosis, the patient could leave the hospital a few days later.

3. A physician went to help a colleague to place a second catheter in the jugular vein, but he did not manage to do so either. When asking his colleague if he had used ultrasound, he
denied. Using ultrasound, they finally managed to place the catheter in the jugular vein. A few hours later, the patient died of hemothorax.

4. A care team decided to treat a patient suffering from a severe chronic obstructive pulmonary disease with a shortened antibiotic therapy. Three days after he had left the hospital, the patient was readmitted to the intensive care unit. A physician had doubts about the initial decision.

5. A patient needed a hip implant. During the surgery, a physician perforated a large artery. Although the care team did everything to save the patient, she died of hemorrhage.

6. Three weeks after an abdominal operation, a patient was readmitted to the hospital with stomach ache. An X-ray revealed that a big clip had been forgotten in the stomach, although the surgical nurse had expressly confirmed that the instruments were complete.

7. A physician discharged a patient who had completely refused all psychiatric treatment offered to him. The patient was in an angry mood and made fun of the physician. The next day, the physician was told that the patient had torn a picture off the wall before leaving.

8. Following a near-syncope, a patient was carefully examined in the emergency unit by a physician. Before leaving the unit, the patient went to the lavatory and suddenly fell unconscious, fracturing two vertebrae.

**Nurses**

1. During kitchen service, a psychiatric patient did not wash the dishes properly. The nurse reprimanded him politely, but the patient yelled at him. The nurse could not stand it, freaked out and yelled back.

2. A psychiatric patient had to write up a menu for the weekend which she was allowed to spend outside of the institution. The nurse did not appreciate the menu. She tore the piece of paper up and threw it in the bin before the patient’s eyes who burst into tears.

3. A nurse was required to wash 20 elderly residents during the night shift in an institution. Completely overwhelmed by this task, the nurse beat some of the residents.

4. Although a nurse and other care team members mentioned to a physician that a patient suffering from cancer would probably not survive the next week, the physician did not prescribe any palliative medication. When returning to work, the nurse learnt that the patient had died in an uncomfortable situation and that her colleagues had gone beyond their responsibilities to alleviate his suffering.

5. A nurse administered the prescribed medication hidden in food because the patient had refused to take it.

6. After a medical examination, a patient was supposed to stay in the hospital for another 24 hours, but he was confused and wanted to leave by any means. Finally, a nurse and two physicians followed him in the staircase, where the nurse brought the patient forcefully to the ground and held him in place.

7. A nurse in the intensive care unit set the dosage of a perfusion pump much too high. For a short span of time, the patient was in danger of death, but he survived.

8. Next to the bed of a patient who was very agitated after surgery, sedative medication was provided in reserve. A nurse gave it to the patient because he would not calm down. Shortly afterwards, the patient’s health status deteriorated massively, and he died under reanimation.
9. A patient in an emergency unit repeatedly called a nurse during the night shift because of strong pain attacks, which were atypical for the presumed diagnosis. The next day, a CAT scan revealed an abdominal aortic aneurysm. The patient died in the operating room.

10. A nurse had to inject insulin to a patient who was a bit confused. In the presence of his wife the nurse slipped with the syringe because of an unexpected movement of the patient, and pierced herself. Both had to undergo further blood tests.