Psychosocial Aspects of the 2021 Flood Disaster in Euskirchen District, Germany: Strains, Resources, and the Role of Social Media

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ABSTRACT

Purpose: With the increasing frequency of disasters, the focus of this paper is on the acute and long-term stress and strain resulting from the 2021 flood disaster and the role of social media in this. Methods: Data was collected through group discussions in the context of world café sessions. In April 2023, three workshops were carried out with various groups of people in the Euskirchen district. Minutes and transcripts were analysed using Mayring's qualitative content analysis. Results: The results indicate a high level of stress for those affected due to environmental, social and psychological factors on an analogue and digital dimension. The strain was usually recognised and acknowledged in the aftermath of the crisis situation. Conclusions: It is recommended that the inhibition threshold for mental health and psychosocial support be lowered further and that a psychosocial situation report be kept over a significantly longer period of time.

Keywords

natural disasters, stress and strain, social media, disaster management, mental health and psychosocial support

INTRODUCTION

In recent years, combined hazard situations in the form of geophysical, hydrological and meteorological crises and disasters (CaD) have increased (UNDRR & CRED, 2020). In particular, the number of natural disasters, especially floods, has almost doubled in the last 40 years (ibid.). The significant impact of natural disasters on a large proportion of the population affects both people's lives and the environment (Berz, 2014). CaD are characterised by a sudden and unexpected discrepancy between perception and coping, as well as heterogeneous and significant impacts on the well-being and functioning of those affected (Quarantelli, 2005). A width of sidewalk can separate a fate of destroyed livelihood from integrity. Those affected show individual reactions and psychological consequences, as well as subjective perceptions of the circumstances. In particular, the emotional and psychological aspects associated with such events, such as fear, loss and survival instincts, depend on individual experiences and characteristics. Mental health is a crucial aspect of overall preparedness and crisis management. Mental health and psychosocial support (MHPSS) aims to reduce the likelihood of clinical symptoms occurring in the aftermath of a CaD. Even today, in 2023, many counselling centres are still maintained and accepted by the population.
In CaD, the available coping resources and basic environmental, psychological and social needs change. As a result, those affected have an increased need for information and communication. Because of their interactive nature, social media (SoMe) provide a platform for private and public exchange. SoMe are already part of everyday life for 70 % of

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users (Paulsen et al., 2023). Among other things, people can share their thoughts, feelings and challenges with and receive support from others (Grieve et al., 2013). As a result, SoMe is increasingly being used in CaD to manage the crisis situation (Norris et al., 2008). To date, scientific research has focused thematically on the needs in the acute phase of CaD and, in terms of target groups, primarily on authorities and emergency personnel (AEP). This article therefore focuses on stress and resource-strengthening factors in the acute and reconstruction phase (RQ1) as well as perceptions and experiences with MHPSS services (RQ2). Starting with a general description of the 2021 flood disaster, scientific findings on stress factors and resources in crisis situations and MHPSS, a detailed description of the methodology used and the data basis is provided. The derivation of the research questions is integrated into the description of the associated studies. Taking these principles into account, the results are presented, discussed comparatively and methodological limitations are highlighted. Finally, specific recommendations for decision makers and conclusions are drawn.

BACKGROUND AND RELATED STUDIES

2021 European Floods

Natural disasters are extreme events caused by natural phenomena that have a variety of characteristics, including the type of underlying hazard, speed of occurrence, duration, predictability, warning potential and magnitude of impact. They can be categorised into geophysical, hydrometeorological and biological disasters, with floods, earthquakes and hurricanes being the most common (Jha, 2010).

The flood disaster that occurred in many European countries in July 2021 was a devastating natural disaster caused by heavy and prolonged rainfall.The countries affected included Germany, the United Kingdom, the Netherlands and others.Caused by a low-pressure system called "Bernd", intense rainfall occurred within a few days, causing water levels to rise rapidly and causing many rivers to burst their banks. The masses of water led to landslides and the destruction of settlements and infrastructure (Junghänel et al., 2021). Around 180 German cities and communities were affected by the flooding (Radio Euskirchen, 2022). The federal states of North Rhine-Westphalia (Euskirchen district and Hagen) and Rhineland-Palatinate (Ahrweiler and Bad Neuenahr-Ahrweiler) were particularly affected. In some areas, 150 litres/m^2 were measured within 24 hours (compared to the average rainfall in Germany in 2021 of 805 litres/m^2 (Deutscher Wetterdienst, 2023)). The flood disaster lasted several days. Although meteorologists had warned of the intense rainfall, the extent and spatial distribution of the rainfall was difficult to predict. In total, more than 180 people died in Germany, about 48 of them in North Rhine-Westphalia (Schröder, 2022).

Stress Factors and Resources in Crises and Disaster situations

Every CaD is a massive collective stressor for the population (Vitaliano et al., 1987), which affects individuals in different ways and forms at the micro (individual), meso (organizational) and macro (societal) level. Personality as well as temporary physical and psychological states act as moderators (Paton & Flin, 1999). Consequently, there are significant individual differences in response to emergency stressors that influence the magnitude of the perceived stress response. The term *stress* refers to all influences affecting a person, both positively and negatively, without any subjective evaluation. Depending on the type of CaD the incurred stress and its processing vary (Galea et al., 2005). Strain can be understood as a negative emotional experience aimed at reactive adaptation in the form of predictable biochemical, physiological and behavioral changes. According to Baum, a distinction can be made between changing the external stimulus through manipulation of the situation and changing the internal effect as an adjustment to the individual interpretation (Baum, 1990). The stresses that AEPs and the population can face have been extensively researched (Leon, 2004) and the physical and psychological health impacts of natural disasters have also been highlighted (Makwana, 2019).
Nevertheless, the perceptions and external stimuli are changing due to the paradigm shift from a passive population to prosumers (Lang et al., 2020). Those affected communicate through SoMe to actively share and search for information (Reuter & Kaufhold, 2017)This can also give rise to stressors from the digital space, such as disruptions in people's lives, relationships and communities (Carroll et al., 2009). Among other things, long periods without new information, long working hours, lack of social support, noise and hazardous substances as physical/chemical factors and reduced boundaries between work and private life can have psychological impact. In summary, there is a need for a comprehensive understanding of stress that takes environmental (primary), psychological and social (secondary) stressors into account (Pearlin, 1989). The factors cannot be viewed in a clearly differentiated manner, but rather determine each other in causal relationships.
The **environmental impacts** of flood disasters include impacts on water quality and infrastructure, as well as the situational factors such as noise and stale smell. Environmental conditions can also have an impact on psychological distress. Noise can lead to hearing damage and trigger stress reactions with long-term exposure to 70–80 dB(A) (Gross, 2012). **Social stressors** in flood disasters are diverse and include both immediate and long-term impacts

in interaction with the social environment, such as significant life changes in relationships or socioeconomic disadvantage (Rufat et al., 2015). In the context of crisis communication, it is already known that defensive crisis communication can damage the credibility of individuals or authorities (Allgäuer & Larisch, 2011) and that it is better to communicate negative information openly and transparently than to hide it (Frewer et al., 2002). Affected people actively search for information, including on SoMe. Furthermore, they disseminate information rapidly and in some cases provide specific situational information that is not available through traditional media (Liu & Austin, 2010). Exposure to flooding can have significant **psychological impacts**, with symptoms of post-traumatic stress disorder, depression or anxiety (Mason et al., 2010). These effects can be compounded by secondary stressors such as health concerns, relationship problems (social), and loss of sentimental items (environmental) (Tempest et al., 2017). In addition, encountering the suffering of others can lead to secondary trauma (Daniels, 2008). Due to the user-generated nature of SoMe, an exchange of information can occur that can lead to exposure to traumatizing media content among unaffected populations (Kreutzer & Köllner, 2020) or to rumors (Nestler, 2017). SoMe has become not only a stressor but also a crucial resource in CaD, fulfilling various functions (Müller et al., 2023). These primarily include social factors such as information dissemination, resource mobilization and psychosocial support through emotional relief and strengthening a sense of community (Simon et al., 2015)Because psychological strain is not only a consequence of the stressors, but also a result of the way a person perceives and evaluates the situation, taking into account their own resources (Lazarus & Folkman, 1984), there is still a lack of knowledge about the long-term strains and resources of the population during CaD (Walker-Springett et al., 2017). Perception is influenced by various factors. One factor is anchoring bias, which illustrates how individuals use a given starting point or anchor when evaluating information or values and anchor their evaluations to that reference point (Tversky & Kahneman, 1974). Another factor, especially in stress-dominated situations, is selective perception. This is characterized by the rapid interpretation of information through the individual lens of one's own expectations, perspectives and experiences, despite the belief that reality is perceived objectively (Glaser, 2019). Furthermore, the negativity bias causes the tendency to pay much more attention to negative information than to positive information (Vaish et al., 2008). In particular, there is a need for further research to examine today´s stresses and resources of the German population after a specific event. Therefore, we propose the first research question (RQ1).

RQ1: Which stress and resource-strengthening factors were particularly relevant for those affected by the 2021 flood disaster in the acute and reconstruction phase?

As SoMe play a crucial role in today's CaD, we also focused on stresses and resources in the digital space.

Mental Health and Psychosocial Support in Crises and Disaster Situations

Since the success of physical reconstruction after CaD also depends on the psychological functioning of the population, early interventions to prevent psychological disorders after natural disasters are particularly important (Kessler et al., 2012). In CaD MHPSS as a system of psychosocial interventions includes (1) strengthening individual and social coping resources, (2) promoting resilience and (3) preventing psychological trauma disorders (Beerlage, 2021). The measures relate to CaD and connected stressful operational situations (e.g. death or danger to one's own life). Grawe distinguishes four psychosocial basic needs: (1) attachment, (2) orientation and control, (3) enhancement of self-esteem, and (4) pleasure gain/avoidance of displeasure. Attachment is the need for interpersonal relationships. Social support therefore plays an important role in individual psychology and has a positive effect on stress management, adaptability and life satisfaction (Cohen & Wills, 1985). Conversely, the lack of social connections can have negative effects on mental health (Baumeister & Leary, 1995). The return to one's own ability to act as an essential act of psychosocial support promotes the satisfaction of orientation and control needs as well as the strengthening of self-esteem (Kernis, 2003).

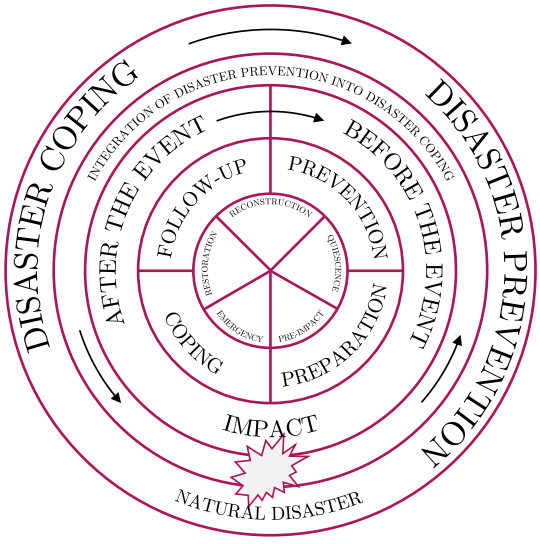

Figure 1. Disaster cycle, combined and revised from (BBK, n.d.; Glade & Alexander, 2013)

MHPSS measures vary depending on the individual characteristics and reactions. However, they also vary depending on the current phase of the disaster management cycle. Figure 1 visualizes this cycle at different levels based on

(Glade & Alexander, 2013). In principle, crisis management is divided into the four cyclical phases of 1. prevention, 2. preparation, 3. coping and 4. follow-up (BBK, n.d.). The psychosocial measures are divided into A pre-activity phase, B activity phase and C the phase after the disaster response (Umeda et al., 2020), whereby phase C can be further broken down on a time scale of two months to several years into relief phase, rehabilitation phase and rebuilding phase (Rao, 2006). Phase A is particularly characterized by preparatory measures aimed at experiencing stressful situations and one's own perception of stress. Due to their preventative nature, these measures are primarily carried out for AEPs (Umeda et al., 2020). The activity phase (Phase B) is characterized above all by immediate physical care and medical care, but also by connecting survivors with sources of support, culturally appropriate forms of mourning for the deceased and normalization of activity and routine as far as possible (Rao, 2006). After the disaster response, activities are geared towards returning to routine and sharing and processing experiences (Umeda et al., 2020). Here (relief phase), primarily empathic and active listening as well as relaxing methods are necessary to support those affected (Rao, 2006). The rehabilitation phase is characterized by the realization of those affected that they must become active themselves and help themselves. Family support and the social environment as well as acceptance and supportive reactions from others are particularly important here (ibid.). Detached from the disaster cycle, MHPSS can be differentiated into two dimensions: (A) temporal and (B) target group-oriented. MHPSS actors act in the short, medium and long-term support, advice and therapy for those affected in CaD (A) (Beerlage, 2021). The target group-oriented dimension (B) takes certain groups of affected people into account when assessing the need for MHPSS measures due to different initial conditions, needs and perspectives. A distinction is made between B.1 measures for survivors, relatives, witnesses and/or missing persons and B.2 measures for AEP. Measures for affected group B.1 are primarily aimed at satisfying the needs for security, reassurance, regaining self-efficacy/control, connection with loved ones, confidence and information (psychoeducation) (Müller-Cyran & Zehentner, 2013). Measures for affected group B.2, on the other hand, also focus very much on preventative measures as part of the integration into health and occupational safety and the employer's duty of care (Beerlage, 2021).

Due to the individuality of reactions and coping processes, it is not only important to understand the perceptions and experiences of those affected and to gain insights into the effectiveness of MHPSS interventions, but also to adapt future psychosocial support services appropriately to the needs of the community. MHPSS interventions are a developing field with few established interventions. This in turn limits the level of awareness of available interventions, as many of those affected are unaware of their existence and implementation. Due to the sensitive nature of personal data, there are numerous data protection restrictions when contacting people who are being supported. An open research question in this thematic field is therefore the RQ2 considered here.

RQ2: How did those affected by the 2021 flood perceive and experience the MHPSS services?

METHOD

As part of the study, workshops were held with people affected by the flood disaster in 2021 in the Euskirchen district, Germany. Qualitative research makes it possible to survey opinions, motives and attitudes in a rule-based manner.The workshops took place on three different occasions with different groups of participants who were involved in the disaster in different ways, see table1. During the workshops, the groups engaged in a dialog using the "world café" technique. The debates were documented for each topic and then transcribed. The transcripts were analyzed in accordance with the research questions using qualitative content analysis according to (Mayring, 1991). Figure 2 visualizes the basic process from recruiting interviewees to analysis.

Participant Recruiting and Data Collection

In cooperation with the Euskirchen district, a large-scale open web survey was carried out in March 2023. Integrated into this survey was a request for further willingness to participate in other exchange formats and consequently the recruitment of participants for the group discussions. The survey was disseminated by the University Wuppertal and the Euskirchen district via various communication channels (radio, SoMe, etc.). As a result, over 1,400 complete sets of responses were obtained from those affected by the 2021 flood disaster as well as spontaneous helpers and AEPs. 215 persons were willing to participate in group discussions (101 of them with characteristics of the target groups). Based on specific queries, three group discussions were held, each with at least 12 persons from different target groups. The discrepancy in the number of people between those on standby and participants is due to logistical restrictions, lack of acceptances and no-shows. Within two weeks in April 2023, thus almost 2 years after the flood disaster 2021, different topics were examined from different perspectives on three different days, see table 1.

The methodical implementation took the form of a world café, a process that records discussions on various issues in rounds and with changing group composition and thus offers a supplement to other established methods of qualitative data collection (Löhr et al., 2020). As a participatory method, this form of group discussion not only

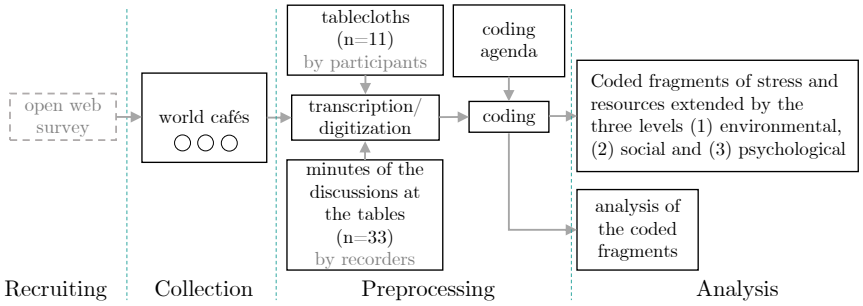

Figure 2. Framework methodology process

provides data for the researchers, but can also be useful for the participants, as they can reprocess their experiences from the 2021 flood disaster in dialog and psychoeducationally facilitate the recording of their own needs (Steier et al., 2008). The participants' discussions were led by the hosts and recorded in writing by minute-takers. In addition, the participants were also asked several times to note down important key points and topics on writable tablecloths. All hosts of the three simultaneous discussion rounds were instructed in advance by the project management and prepared for the methodology with the help of rules and sub-questions on the discussion topic. Minutes were taken using a semi-structured template.General notes on the course of the discussion were recorded, and frequent or controversial topics were explicitly noted. In order to be able to identify particular focal points across the different groups, the note-takers were also asked to note topics discussed twice and to set time stamps.

Table 1. Topics of the world café sessions

date 1 *AEPs*	**date 2** *affected persons who have made use of MHPSS*	**date 3** *helpers of MHPSS*
special stress and resilience factors	special stress and resilience factors	classification of requirements for MHPSS
use of SoMe		
preparation and training	development wishes MHPSS	development wishes MHPSS
role of SoMe		

Data Preprocessing and Analysis

Both the protocols and tablecloths were transcribed after the events and coded deductively-inductively as part of a content-structuring qualitative content analysis (Schreier, 2014). The core of the content-structuring approach was to identify and conceptualize categories within the framework of selected content aspects and to systematically describe the material with regard to stressors, resilience factors and experiences as well as perspectives on MHPSS. Based on the modified version of the procedure according to Steigleder, a combined deductive-inductive formation of super- and subcategories was implemented. The upper categories were formed thematically, while the subcategories were identified as in vivo codes (Steigleder, 2008). A total of N=996 codes were allocated to a category, with the possibility of multiple codings.

RESEARCH FINDINGS

The 2021 flood disaster (14/15.07.2021) was a natural disaster with severe flash floods and various damages. 73 % of respondents to our open web survey indicated at least a medium level of psychological stress in relation to the impact on their own household (approx. 10 % no stress at all), more than 87 % in relation to the wider social environment. Up to one month after the flood disaster, the subjectively perceived at least medium high stress is assessed by the majority (81 %) due to the impact on the immediate social environment (4 % not at all, 5 % very low, 10 % low), approx. 67 % in relation to the impact on their own household (15 % not at all, 9 % very low, 9 % low). Overall, both primary and secondary traumatization put a heavy strain on the population, which extends beyond the coping phase.

Stress and Resource-strengthening Factors During the Flood Disaster 2021 (RQ1)

During the emergency phase (see figure 1), the focus of those affected and AEPs was on saving lives and taking the acutely necessary measures to prevent or minimize damage. During the group discussions, it became clear that the focus of all participants with different degrees of involvement was and is on the stress factors and less on the resilience factors. In a direct comparison, 57 % of the coded fragments were categorized in the "stressors" category, 43 % in the "resources" category (n_{total} = 402 coded fragments). Risk and crisis communication in relation to the flood disaster was discussed very controversially. The information required to assess the risk was not received by everyone and was also interpreted differently. In particular, the indication of the expected amount of water in l/m² was negatively emphasized, as many did not know how to interpret the warning. Crisis communication was felt to be inadequate not only before the prevention phase, but also during the disaster coping phase. The lack of communication about what was happening in the Euskirchen district led to uncertainty. Furthermore, the extent of the damage in the Euskirchen district was hardly discussed during the coping phase. This led to a feeling of not being seen and not having one's suffering acknowledged until the group discussions almost two years after the event. However, the psychosocial stress was overshadowed by the material and acute life-threatening stress during the coping phase. Figure 3 schematically illustrates this temporal relative relationship. In order to coordinate crisis management and to react appropriately to a CaD a general situation report is created and maintained. The psychosocial situation report, as a specialised form, supplements the overall picture with the aspect of the psychological factors and needs of the population groups. The need for MHPSS depends on various factors and the course of mental coping is described as fluctuating, but above all as lasting. Consequently, the psychosocial situation reportand crisis management must be maintained beyond the period of the general situation report. During the group discussions, noise and specific smells, such as the musty smell of the basement, were still described as significant stress factors in the coping phase and triggers for physical and emotional reactions, even two years after the flood disaster. In the first few weeks after the event, there was no way to mitigate the noise pollution through cleanup, heavy machinery and other vehicles, or to find a quiet place to rest. The sludge and exhaust gases emitted by the machines led to unpleasant odors in the long term. In addition to these factors, rumors in particular were mentioned as a burden from the digital space (especially SoMe) with an impact on analogue events. What is particularly striking here is that it was not the quantitative amount of rumors, but rather the impact of individual ones that was actively discussed by all groups. A key point here were the so-called "flood tourists". The resulting burden was not necessarily due to the value of the looted items, but rather to the fact that those affected could not imagine looters wanting to profit from their suffering. The same effect was achieved by people who traveled to the flood areas for self-promotion purposes on SoMe in order to supposedly help there and thus generate more followers.

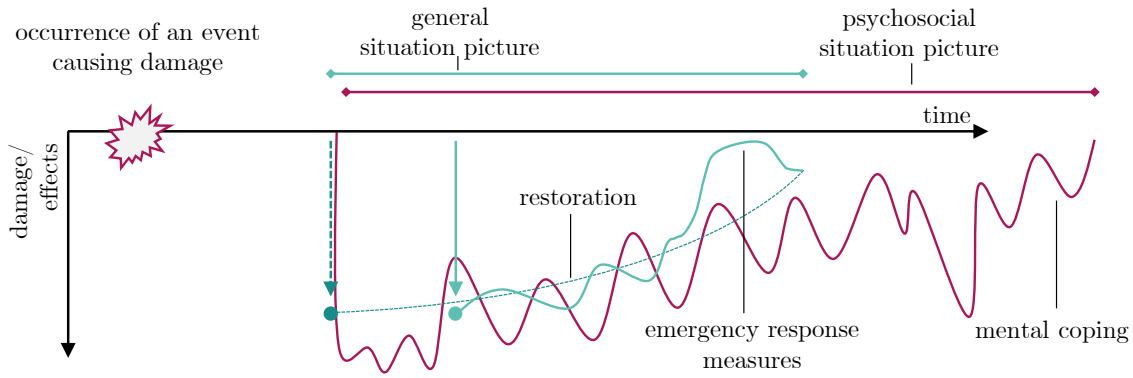

Figure 3. Schematic progression of crisis management, broken down by material/environmental (mint) and psychological consequences (pink), revised and expanded from (BSI, 2023)

SoMe were highly valued as a communication medium. First, it allowed individuals to reach out to friends and family and inquire about their well-being. Second, it made it easier to organize self-help groups and relief campaigns. SoMe was used to launch appeals and set up support groups. After the disaster, thousands of volunteers from all over Germany traveled in cars and buses to help. Donations of relief supplies were also received from large corporations. In addition, SoMe played a role in informing the public during the disaster. However, those affected noted that communication was not always possible. During the acute phase and shortly afterwards, the mobile phone network collapsed, making telephone calls and internet access impossible. The inability to monitor the well-being of their social environment and the lack of protection from external factors were identified as sources of stress. SoMe were therefore, only when usable, a resource to strengthen the community. The sense of community between

those affected and those helping them was cited several times by all groups as the most important resource-creating factor. The gratitude for the large number of people who selflessly helped in the CaD areas was still discussed immensely two years after the event.

Perception and Experiences with the MHPSS Services (RQ2)

The perception of circumstances is subject to many influences that can distort them. As a result, even the same stresses lead to different strains. The significantly different levels of stress in the course of the flood disaster led to a population with very different levels of strain. During the group discussions, many of the participants rated their own stress in relation to the known extent of damage to others. This also resulted in a corresponding classification of their strain, which in turn led to a trivialization of their reaction. On the micro level (individual), this showed an alignment of the reported stress with the macro level (group-specific), which was also visible between the different dates and target groups. Both those affected and the AEPs described communication problems, noise, smells and flood tourists as stress factors. However, it was also often stated that the stress on others from the immediate or wider social environment caused individual reactions, even to the point of strain. A danger from this can be that as the comparison number increases with SoMe, the subjective feeling of strain and the probability of seeking help decreases.

One significant difference between the target groups of AEP and those affected was in the perception of MHPSS. While both groups rated the services extremely positively, for the AEP the service was clearly known and sometimes mandatory in group settings, while not all those affected had information about the services (in the open web survey, almost 30 % of respondents said MHPSS was not known). The timing for disseminating information from MHPSS services was explicitly highlighted in the discussions. In the early stages of the coping phase, several initiatives, brochures and MHPSS services were provided. The offered MHPSS services were available during the day, particularly during clean-up operations. Some affected people said they were unable to accept such offers because of their focus on the cleanup efforts. From the perspective of the helpers of MHPSS (third date), the demand for MHPSS services exceeded the availability of various MHPSS offerings around three months after the event. The use of support services was perceived to be very fluctuating. Coping with a CaD presents individuals with numerous challenges in terms of preparation, assessing the situation, making decisions and dealing with stress (Enander, 2021). This process is not linear, see also figure 3. Although many people are open to using the support services, the fluctuating psychosocial demands and the partial lack of self-reflection result in the intensity of the population's use of MHPSS services fluctuating over time. Building on this, it was repeatedly pointed out in all three groups that the inhibition threshold for MHPSS measures needed to be lowered and awareness of the need for such support needed to be increased. The fear of social repercussions such as disrespect from one's own environment or the stress of having to explain oneself often outweighs the inclination to seek help. The terminology "psyche" also plays a negative role in the evaluation. In order to lower the inhibition threshold, the participants suggested measures such as active contact, more advertising, transparent information or organized meetings in cafés or similar places. A combination of active and passive (come and go structure) should be aimed for here.

DISCUSSION

The aim of the study is to investigate stress and resource-inducing factors of the 2021 flood disaster, with a special focus on the digital space (SoMe) and experiences with MHPSS services. Three group discussions were conducted as world cafés with affected persons, AEP and MHPSS staff in the Euskirchen district. Participants mainly focused on stress-triggering factors, and the psychosocial situation outlasted the general crisis. The digital situation significantly influences the analogue situation (RQ1). MHPSS, as a resource-enhancing factor, was perceived positively in the group discussions, but awareness was rated as insufficient and utilisation was not low-threshold enough (RQ2).

Comparative Discussion

The results of the structuring content analysis align with other scientific findings. The **focus on negative information**, encompassing stress-inducing factors, has been previously discussed under the term negativity bias (Vaish et al., 2008). The identified referencing of one's own stress to the macro level has similarly been analysed in the context of the anchor effect and selective perception (Glaser, 2019; Tversky & Kahneman, 1974). The anchor serves as a comparative value referencing a negative experience of another person in the context of the anchor bias. In the context of selective perception, those affected assume that others are more affected and neglect their own affectedness. To date, there is no external evidence that individuals downplay their own impact in CaD. Similarly, there is a lack of evidence as to whether others underestimate the extent to which they are affected by such disasters or whether this

influences the utilisation of MHPSS. Nevertheless, Plapp (2003) examines this issue and concludes that personal relationships with the affected area determine the degree to which CaD are relativised. Further research in this area is necessary to analyse the identified "**diffusion of stress**" more deeply. Further, **crisis communication** should be comprehensible, precise, specific, call for action and locally controlled (Aguirre, B. E., 2014). Communication should take place via various media, including SoMe. The provision of information via SoMe was a key factor for those affected. The lack of information and the lack of attention to the extent of the damage in the media was perceived as an additional stressor.

Frewer et al. (2002) argues that some information, even if insufficient, is preferable to no information at all. An information status display also reduces the likelihood of rumors, frequently discussed as a negative factor in the digital space affecting analog events. However, it's not the quantity of misinformation that matters, but rather its quality, credibility, and dissemination. The study by Fathi and Fiedrich (2022) revealed that only 5 % of social media posts related to the flood disaster were misinformation, yet this could have a significant impact.
Exposure to **noise and odour** is particularly relevant in the area of occupational health and safety. Loud and persistent noise poses a potential risk to health and is categorised as a hazard in the occupational health and safety risk assessment. The multifactorial exposure causes a link between the environmental conditions and the emotions and feelings. This link between sounds or images and the triggering of post-traumatic stress disorder has already been well researched (Pausch & Matten, 2018). Interestingly, the sight, i.e. physically seeing the flooding and destruction, was not explicitly mentioned as a stress factor in the group discussions conducted. Further research is needed to determine whether this was simply not addressed due to its obviousness or whether it may be a case of desensitization from watching disasters on TV or similar.
The shared experiences of disaster-affected individuals foster the development of **group affiliation** or community, recognized as a crucial factor in resource mobilization. According to the social identity theory proposed by Tajfel and Turner, people tend to categorize themselves and others based on shared characteristics like gender, ethnicity, and religion, leading to community formation. Social media (SoMe) facilitated communication within and beyond these communities, a point underscored during discussions. Currently, organizational and communication practices via SoMe are considered typical Zisgen et al.

The coping response in CaD may require MHPSS services, yet the reluctance to seek counseling remains a significant issue. While some guidelines acknowledge the challenge of seeking psychological help, the existing barrier is often deemed too high (Nikendei, 2012). To address this, the group discussion suggested promoting active contacts and transparent information provision by the Federal Office of Civil Protection and Disaster Assistance. The study's results indicate that psychological stress lingers long after the event, suggesting a prolonged need for psychosocial situational awareness. Solomon and Green suggests psychological consequences can last up to three years, with most symptoms subsiding after 16 months (Solomon & Green, 1992). The peak of symptoms occurs one year after the disaster, followed by gradual improvement (Goldmann & Galea, 2014).

Methodological Limitations

The chosen combinatorial structuring content analysis methodology, relying on minutes and tablecloths from various world cafés, has limitations. Participants were recruited through an open web survey, lacking random sampling or representativeness. This generated a sample of intrinsically motivated individuals willing to participate in both the survey and group discussions. The extent of the damage made it difficult to clearly distinguish between the groups of people on the three dates. The group formation and invitation was carried out in waves, whereby acceptances from the participants' social environment were also taken into account. The study aimed for qualitative insights, not quantitative data. Gathering information from other regions could enhance findings. Conducted almost two years post-flood, there's a risk of recall bias alongside selection bias. Distance to the event may distort memory accuracy. However, selective perception in CaD doesn't weaken surveyed factors' relevance. Methodological limitations include information bias due to different hosts and minute-takers impacting participant involvement. For reasons of clarity, no distinction was made between stress and strain in the group discussions, meaning that it was no longer possible to differentiate between them when coding. In addition, the content analysis lacked a reliability check. Further validation is planned through open web survey and interview analyses, with knowledge application in practice through practitioner exchanges.

Implications for Decision Makers

Implications for decision makers in CaD, drawn from group discussions with affected persons, AEPs, and MHPSS staff of the 2021 flood disaster, include:

1. Establish trust in SoMe early in the prevention phase for effective risk and crisis communication. Ensure open communication, sufficient personnel, and clear language. Use practical comparisons and explicitly name potential hazards to raise awareness and assess individual vulnerability. Consider that naming the extent of damage is crucial for those affected.
2. Stress from rumors in the digital space is influenced by proximity and reach, not volume. Early denial by public bodies, supported by credible SoMe accounts and consistent communication, can mitigate this stress. Enhancing population media skills is essential.
3. Support the population during the restoration phase by distributing personal protective equipment, such as earplugs or odor inhibitors.
4. Increase awareness of psychosocial stress and MHPSS services. Psychoeducational measures should cover stress reactions, secondary traumatisation, and the use of MHPSS. Offer services in a flexible structure integrated into community activities during the coping phase.
5. Maintain a long-term psychosocial situation picture and crisis management beyond the coping phase.

CONCLUSION

The flood disaster in July 2021 caused deaths and extensive damage due to heavy and prolonged rainfall, affecting people across regions. They faced challenges such as unclear crisis communication, theft, and the loss of loved ones. The changing society and the rise of digital communication led to the first research question:
RQ1: What stress and resource-strengthening factors were particularly relevant for those affected by the 2021 flood disaster in the acute and reconstruction phase?

Group discussions highlighted analog stress factors, like noise and stale smell, with a strong emphasis on the lack of crisis communication, including via SoMe. Various groupings noted that information from SoMe impacted physical events and actions of those affected. Discussions suggested addressing population needs not in the acute phase but during coping. The interrupted flow of communication and a lack of information about the social environment, due to everyday use, added an additional burden, deviating from everyday life in today's networked world.

MHPSS played a major role in processing deviations from everyday life in the 2021 flood disaster. To gain further insights into CaD with a focus on MHPSS, the study explored the second research question:
RQ2: How did those affected by the 2021 flood perceive and experience the MHPSS services?

While MHPSS services are not universally known, group discussions predominantly reported positive experiences. Various development wishes were discussed, indicating optimization potential in this area.

Further research is crucial due to the increasing likelihood of natural disasters. Investigation into factors contributing to stress and resources in CaD in today's society is essential. Identifying consistent factors through comparisons with other disasters and assessing the effectiveness and acceptability of MHPSS in CaD require additional research. As part of the research project #sosmap, further quantitative and qualitative data will be collected to shed light on the current status of the MHPSS and explicitly the role of SoMe from the various perspectives of the population as well as the authorities and emergency services. The data already collected as part of the study (survey results and interview transcripts) will be analyzed in greater depth with various objectives in mind. These include the perception of the MHPSS and a comparison between self-reported use of SoMe compared to identifiable information in publicly available sources.

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