



Research article

Solastalgia's mourning and the slowly evolving effect of asbestos pollution: A qualitative study in Italy



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ARTICLE INFO

Keywords:

Psychology
Place attachment loss
Elisabeth Kubler-Ross model
Solastalgia
Disaster
Attribution processes
Mourning
Asbestos pollution

ABSTRACT

In Italy, the problem of asbestos pollution is increasing in severity. In fact, in recent years, the number of people affected by asbestos-related illnesses has been growing because of the fibre's slowly evolving effects and its progressive pollution in the environment adjacent to the places where it is processed. Even though the physical consequences of asbestos are now quite clear, few studies have examined the psychological consequences of this kind of disaster. Since it is difficult to perceive its pathogenicity in daily life, this study was conducted in the affected areas of north-eastern Italy, using the qualitative research in psychology with 51 persons who experienced asbestos-related illnesses (19 sick persons and 37 relatives of sick persons). Their narratives described being rooted in a space contaminated by an invisible enemy. In particular, attention was paid to the consequent *solastalgia*, a kind of mourning arising from loss of place attachment. Results of the qualitative analysis revealed how the different phases of the Elisabeth Kubler-Ross DABDA (Denial Anger Bargaining Depression Acceptance) model of coping with death constitute such feelings, whereas the dual-process model of Stroebe and Schut emphasised how these people seem to be loss oriented because of their perceived lack of community restoration. A discussion of the relationships between attribution of responsibility, entirely external and mostly inscribed in the DABDA categories of 'anger' and 'acceptance', is presented, with further considerations about mourning and the need to improve specific psychological support in this field of environmental disaster.

1. Introduction

Disasters belong to an outsized set of potentially traumatic events that vary greatly in magnitude, in the warning collectively experienced, and in the proportion of the population involved (McFarlane and Norris, 2006). The prevalence of psychologically negative outcomes depends on the severity of the loss and the degree of community disruption (Norris et al., 2002). Although it is sometimes difficult to discriminate the typology, they are generally classified as natural or human-caused. Nonetheless, this distinction is somewhat deceptive because the upshot of most natural disasters is intertwined with the technological transformation of environments and there is no evidence that the one type has a greater impact on mental health than the other (Rubonis and Bickman, 1991). Indeed, all disasters provoke fear, helplessness, and horror (Galea et al., 2005), but technology-related ones are frequently followed by lasting disputes concerning the allocation of blame, which divides

communities, particularly when someone is privileged and perceived to show little concern for others (Norris et al., 2002). Figure 1 illustrates the DABDA model and its relationships with solastalgia in our group of participants.

Pollution is a particular form of disaster that occurs in both natural and technological disasters (National Institute of Mental Health, 2002). Asbestos pollution belongs to this entangled area, and its consequences to physical health are extremely dangerous and characterised by slowly evolving effects. Researchers have postulated that the social consequences of slowly evolving environmental disasters have their own psychological outcomes for the victims (Cline et al., 2014). Indeed, it is difficult to understand whether people continue to live in asbestos-polluted areas because they are particularly attached to their place or because they have lost the ability to react. Literature shows that when individuals' sense of space is particularly significant, it may act as an 'anchor' that reinforces and deepens feelings of belonging

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<https://doi.org/10.1016/j.heliyon.2019.e03024>

Received 14 July 2018; Received in revised form 24 February 2019; Accepted 6 December 2019

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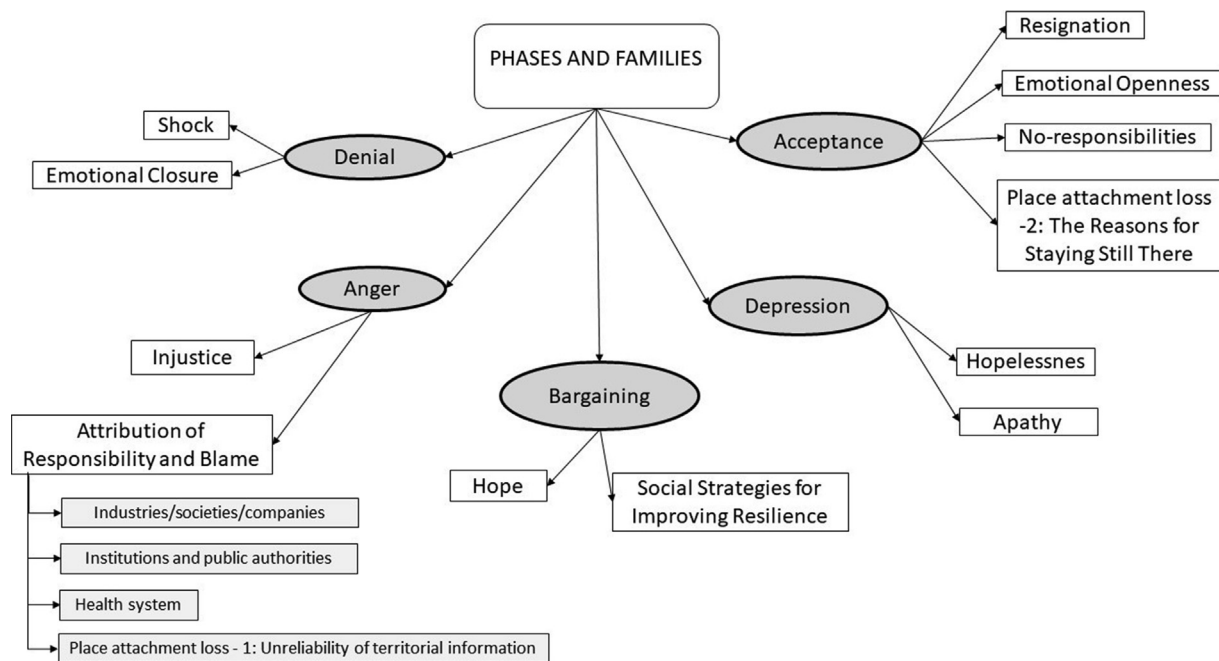


Figure 1. The DABDA model of coping with death of solastalgia following the qualitative analysis.

(Chamlee-Wright and Storr, 2009; Smith and Cartledge, 2011). In fact, after other types of disasters, many people continue to live in the same place despite the hardships they experience there. From a sociological point of view, this effect is related to the efficiency of social capital networks that can transform the trauma of the community into an experience that improves solidarity (for a review, see Béland, 2014). Place attachment may partially explain this phenomenon, typified by emotional ties people establish with the places where they live and feel protected and satisfied (Afshar et al., 2016; Devine-Wright, 2009; Hernández et al., 2010; Mazumdar, 2005), comfort and security, and home-friendliness unified by community relationships (Eisenhauer et al., 2000; Jorgensen and Stedman, 2001; Lai and Kreuter, 2012). Separation from one's place of attachment may compromise one's mental health, and when residents are not physically displaced, they may find that their feelings of attachment are affected by negative environmental changes (Hess et al., 2008). In such situations, two kinds of affection may arise: disorientation and reorientation (Cox and Perry, 2011). The first one indicates something similar to mourning, while the second one consists of the restoration of meaningful places (in both a physical and symbolic sense), which is crucial for the re-establishment of the residents' sense of home and community (Cox and Perry, 2011). This dialectic is really similar to the dual-process model, which describes two different ways of coping with bereavement (Stroebe and Schut, 1999). The former is 'loss oriented', characterised by feelings of grief and depression, while the latter is 'restoration oriented', in which mourners actively reconstruct their lives in or with the community.

As scholars emphasize, many emotions play an important explanatory role in coping responses towards environmental disasters (Warchal and Graham, 2011). In particular, *solastalgia* has been used to describe the negative feelings in terms of place attachment loss, which creates an amalgam of feelings similar to mourning in those who live in environmentally degraded places (Albrecht, 2005; Albrecht et al., 2007; Warsini et al., 2014). It is characterised by the loss of value, the feeling of dislocation and of being undermined by forces that destroy any possible solace, and it is similar to homesickness, although it is experienced at home.

Living in polluted areas leads to many psychological difficulties. The literature has already described the severity of the distress levels arising from this situation (Downey and Van Willigen, 2005). Indeed, many

valuable studies have been done on place attachment, but they do not fully incorporate a sense of place into the disaster recovery process. It is possible to hypothesise that people continue to live in asbestos-polluted areas because of their place attachment and the restoration activities (Lai and Kreuter, 2012), but on the other hand, it is possible that this phenomenon is caused by hopelessness as well, which is characterised by withdrawal into oneself and grieving. In fact, as indicated by the literature, slowly evolving environmental disasters imply negative dynamics in communities, and the social consequences have their own toxic effects on individuals' psychological adjustment (Cline et al., 2014). In particular, the first aftermath is the weakening of the restoration processes.

Among slowly evolving disasters, asbestos pollution is one of the most dangerous (Cline et al., 2014). It is related to human culpability and characterised by slow and insidious development, difficult detection, and chronic health risks that profoundly affect actual and perceived human safety.

Asbestos is a kind of silicate (serpentine and amphibole) that, before the discovery of its pathogenicity, was used from the 17th until the 20th centuries all over the world in numerous industrial applications. This was because of its incorruptibility, heat resistance, sound absorption, and thermal insulation properties, but also because it is cheap and easy to find. Even though this mineral is characterised by different chemical and fibrous structures, its effects on humans and the environment are similar and in all cases highly dangerous. The main factors in asbestos pathogenicity are fibre dimension and bio-persistence (Aust et al., 2011). Asbestos causes two main forms of pollution: the first concerns the settings of work, and the second one occurs in the larger environment outside of work. Thus, there are two ways to be exposed to asbestos: occupational and environmental. Indeed, all kinds of contamination by asbestos fibres are alarming problems because the illness caused by inhaling the fibres is quite severe and mostly fatal. The crystalline structure of the rock can break down into very thin fibres that, if absorbed, are extremely pathogenic (Baumann et al., 2013; Carnevale, 2007; Inail, 2016, 2018). The disease's severity depends on the duration of the exposure, the intensity—that is, the quantity of toxic powder absorbed—and the individual's reaction (see Ak et al., 2015; Gilham et al., 2015; Oury et al., 2016; Solbes and Harper, 2018). There are different asbestos-related diseases. Among them is mesothelioma, a cancer caused only by asbestos exposure. But other cancers, such as those

of the lungs or ovaries and carcinoma, which are much more frequent and caused by other factors, can be asbestos-related as well. Thanks to the ban on asbestos use in many countries, occupational exposure to asbestos has decreased since the 1980s. However, environmental contact with asbestos is increasingly growing, multiplying the number of cases, particularly in women (Baumann and Carbone, 2016; Bourdès et al., 2000). Classically, mesothelioma appears in men aged 70–74 years old due to occupational exposure and has a latency period of about 30–50 years (see Carnevale, 2007; Yoshizumi et al., 2001; Olsen et al., 2011; ReNaM, 2015). In places where the polluted environment also causes mesothelioma, the proportion of women increases and the mean age at mesothelioma diagnosis decreases (Baumann and Carbone, 2016; Bourdès et al., 2000). This epidemiological data highlight the importance of the problem posed by this mineral since it is now clear that it is not enough to stop its industrial use and that it is necessary to reduce its environmental pollution as well.

In Italy, the use of asbestos was banned in 1992 by Law n. 257, which promoted the mineral's disposal and elimination. In numerous areas, these silicates had been used as building materials, and because of various stages of extraction, processing, and exporting, many people touched and inhaled them (Bullian, 2013). Since the ban, the Italian Ministry of Environment has listed 33,610 deposits (Piano Nazionale Amianto, 2019), which supplied 3,748,550 tons of the rock (Ferrario, 2009). Furthermore, at least 100 million square metres of the mineral are left, of which 1 million square metres are located in 600 deposits in the region of Friuli Venezia-Giulia. In particular, between Gorizia, Monfalcone, and Trieste, the shipbuilding and port areas have been intensely developed, so they are exceptionally asbestos-polluted (Bullian, 2013), while inland, industrial complexes linked to port activities account for about 1,000,000 square metres of asbestos concrete roofing (Legambiente, 2011; ReNaM, 2015). Epidemiological studies confirmed that in these regions, the highest rate of mortality is caused by this pollution (Comba and Fazzo, 2017). These regions report some of the highest incidences of mesothelioma worldwide (Biava et al., 1976). Since not all the asbestos installations have been removed, the research on the consequences of environmental exposure to this kind of pollution is quite scarce, and the long latency period of asbestos diseases delays the individual and social reactions, we think that the consequences of this kind of disaster in terms of public health in Italy are only beginning to emerge (ReNaM, 2015). That is why it is vital to study the psychological impact of the situation. To date, little attention has been paid to the psychological effects of asbestos among exposed subjects, and the literature is scanty (Cline et al., 2014; Mounchetrou Njoya et al., 2017). Therefore, the main aim of our study is to analyse the kind of damage is done by asbestos, an invisible enemy against which it is almost impossible to fight.

2. Aims and research phases

The fundamental research question that guided our study was inspired by the dual-process model, sharing the conviction that the phenomenology of *solastalgia* linked to environmental disaster should consider different elements: on the one hand, the relationship between the emotions derived from loss, and on the other, the presence/absence of restoration processes thanks to community rebuilding. It was particularly important to recognize the role of negative feelings such as anger and resentment and the specific experience of living with asbestos illnesses in the area between Gorizia, Monfalcone, and Trieste. First, we focused on the emotions that sprung from place attachment between loss and the community process of restoration. Since asbestos is an invisible enemy and its pathogenicity acts slowly, we have taken it for granted that underestimation of the problem can be widespread among people who do not yet have to deal with the appearance of the first signs of asbestos-related diseases. For this reason, we wanted to listen to people who were already sick or suffering from a bereavement caused by this material. Then we identified narratives that are inherent to the pathologies,

exploring the emotions derived from the awareness of environmental pollution and its history. Our latent suspicion was that feelings of hopelessness characterise the loss orientation experience, on the one hand improving the adaptation to chronic mourning, and on the other reducing the impetus towards restoration.

Shadowing the CORE-Q checklist (Tong et al., 2007), the structure of the research evolved through several phases: review of asbestos pollution all over the world and in particular in Italy; definition of the themes; selection of the area with a high incidence of asbestos pathologies; review of the epidemiological studies inherent to the selected area; definition of the research aims and methodologies; contact with territorial health structures and associations and with the first potential participants; snowball sampling; informed consent, interviews, and tape-recording of narratives; and analysis of the main issues. Although the possibilities of grouping issues in the texts were countless, it became apparent after we first read all of them that the emotions in the narratives could be categorised using Elisabeth Kübler-Ross' DABDA model of coping with death (Kübler-Ross, 2005), which lists five non-linear and intertwined emotional states following loss: *denial* (shock and negation of the dramatic reality); *anger* (caused by the refusal of loss); *bargaining* (attempts to avoid/ameliorate the situation); *depression* (hopelessness); and *acceptance* (adaptation to the situation). Those phases were used as the structure of the categorisation, which led to further and more specific topics. The analysis process developed in the following way: transcription and creation of all the texts in Word; preparatory organisation of the texts; identification and generation of categories or themes; creation of coding data; understanding the prototypical phrases of each code; searching for alternative explanations; selection of the relationships between the main categories; and discussion and writing the report and constructing the diagrams.

3. Method

Fifty-one persons (average age 67 (SD 13) (26 males, 51%; 25 females, 49%) living in a plague area of north-eastern Italy, including 19 sick persons (37%), among whom nine (47%) had benign tumours and 10 (53%) had malignant tumours, and 37 relatives (63%) participated in the study. All the pathologies (those described by relatives and sick persons) were related to the workplace. Thanks to territorial health departments and dedicated associations, some initial participants were contacted, and snowball sampling followed. This non-probabilistic form of selection was excellent because it permitted us to call people who already felt related to each other due to their similar conditions.

Before starting, the topics and the focus of the study were explained to the interviewees, and the tools and techniques of analysis that would be used were described. After this first phase, they were asked to sign the informed consent. The research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

The survey was created using qualitative research in psychology, with in-depth interviews because this approach makes it easier to understand subjective stories in healthcare research (Testoni, Russotto, Zamperini and de Leo, 2018c). This kind of qualitative data collection was chosen because it offered the opportunity to capture rich, descriptive narratives about participants' behaviours, their attitudes, and perceptions. They were carried out face to face by a female psychologist-trainee interviewer who paid particular attention to the body language of the respondents to observe their psychological condition and create a positive climate, thereby preventing any form of stress during the dialogue. Before beginning the work, the interviewer was trained to conduct empathetic dialogues and to listen rather than talk. The meetings were conducted in places chosen by participants (usually their home) to make them comfortable and facilitate their spontaneity. Respondents were encouraged to explain and share their experiences and to feel free to say everything they thought or remembered. The interviewer followed an elastic, non-rigid grid of topics that were useful to support the dialogues and paid particular attention to the needs of the interviewees, trying to

follow in a delicate but coherent way the meaning of their issues. Most of the interviewer's questions aimed to check if the themes were perfectly comprehended and to facilitate the deepening of the themes that emerged. Questions that were useful to improving the dialogue included, 'When and how did you (or your relative) learn about the pathology?'; 'What were your emotions and those of your relatives?'; 'How did you handle your family's health information?'; 'Did you feel the need for help?'; 'Who or what helps you get through this experience?'; 'Why did all this happen?'; 'Did someone help you?'; and 'How do you think this problem should be handled?' All the conversations were tape-recorded. The work of the interviewer was constantly supervised by a female psychology and psychotherapist professor.

The analysis of the text, which involved three researchers, followed six main phases. At all stages of the process, memos, and comments were written down to record the interpretative path. In the first phase, the recorded conversations were transcribed verbatim, whereas the interviewer's questions were used as notes and only the participants' answers were processed. In the second phase, Atlas-ti computer-assisted qualitative data analysis was selected because it permits examining the narratives in terms of their principal concepts (Testoni et al., 2017) on the basis of both prior ideas that were inherent to the research question (grief experiences between 'restoration' of 'loss' orientation) and concepts that only became clear as the analysis proceeded. In the third phase, the text was segmented into significant 'quotations' to transform them into 'hermeneutic unities' through the creation of the 'codes' (basic categories). In the fourth phase, the codes were transformed into 'families' (hyper-categories) on the basis of their within relationships, which were identified by analysing the notes. In the fifth phase, the relationships between families were developed into the final 'conceptualization' from the initial recognition of 23 codes within the 5 family categories of the DABDA model of coping with death that could describe the structure of the *solastalgia* mourning experience. The final phase was inherent to the construction of the graphs that describe the relationships between the families (Zamperini et al., 2015). All the phases of the analyses were agreed upon by all three authors, who considered the different main interpretations and decided on the final one.

The study respected the APA Ethical Principles of Psychologists and Code of Conduct and the principles of the Declaration of Helsinki and obtained the approval of the Padova University Ethics Committee for Experimentation.

4. Results

While our analysis showed that it is possible to consider that *solastalgia* is composed of different categories, for this initial qualitative investigation, the five factors of the DABDA model of coping with death are a better conceptual framework because they can integrate many different codes to interpret all the narratives of participants in a unified way.

4.1. Denial

In the DABDA model, this phase is characterised by shock and negation. Rosa's narrative perfectly exemplifies this psychological condition. She is the widow of a mesothelioma patient. Ten years have passed since the loss of her husband, and it is only now that she feels free to tell her story. She lived in isolation for years because she could not talk about her bereavement. Now she is trying to find a way to start again, and, in particular, she thinks it is important to fight by involving public opinion:

When I heard about my husband's illness I felt so angry because he was sick from his work! But after the news [...] I put my head in the sand. My husband told me he was well, but he knew he was severely sick, he was aware of how serious his condition was. After pleural plaques, he had mesothelioma for about a year. I pretended it was

nothing to avoid having to face the problem. Even at home and with our children we didn't want to face the problem—this big problem—and we never talked about death. After his death I had to manage a totally new situation [...], I was troubled and disoriented [...]. However, for my husband death was a relief; knowing that you have no hope makes a difference.

In the other similar narratives, this phase was characterised by two prevalent matters: *shock* and *emotional closure*. The first one described the immediate reaction to the bad news:

This news was traumatic. I couldn't even cry and I couldn't believe it was true. That situation was totally unknown and it frightened me [...]. Receiving that bad news was like a bomb explosion. It was difficult to be conscious of what would happen to him and how he would die.

The second matter inherent to the narratives described the need to hide the problem:

I never wanted to talk about it, either before or now. I preferred to keep it hidden. I didn't have the courage to face it. [...] I never wanted to face the problem because I knew what it could bring, and I preferred not to know too much.

They told me that the disease had worsened. I prefer not to think about it. I try to be indifferent.

At home we preferred not to tackle the problem and nobody spoke about death. [...] I have never wanted to talk about it, either before or now. It's a fact that doesn't affect me [...] and if I don't think about it, I'll live better.

4.2. Anger

In the DABDA model, this phase is characterised by hostility and resentment, as Teresa's narrative perfectly exemplifies. She is a woman in her eighties, a simple person, with particular respect for the values of the family and the church. She has always worked hard, and Guido, her husband, worked in a shipyard. Guido, a few years after retiring, knew he was sick with mesothelioma:

When I knew what might have happened to my husband I couldn't think of it. [...] The company is to blame! I am really angry at them because they had to know and I'm sure they knew that asbestos hurt. They had to make this known. I washed my husband's blue overalls! Inail and the Unions are guilty. It was their job to protect the workers, but they didn't.

The narratives that compose this phase are characterised by two prevalent issues: the *attribution of responsibility and blame* and the *sense of injustice*. Concerning the first one, nobody ascribed blame to him- or herself for his or her physical or psychological suffering. Responsibility and blame for all the negative effects of asbestos were ascribed first of all to the industries, societies, and companies that used the mineral:

The most intense emotion was the grudge against the companies that allowed this event [...]. I'm sure the directors and the managers knew the asbestos hurt but they didn't tell us anything [...]. They are guilty because they did not permit the workers to discuss the problem altogether! Only a few people approached the question!

I'm angry because companies have looked at their profits. The workers were forced to work even if they knew the problems related to asbestos. They certainly knew the dangers, but they ignored it to make money.

Also, institutions, public authorities and the health system were considered guilty:

This situation makes me angry because people can't die of working. It is an injustice and public authorities should have prevented it!

It's unbearable because there isn't the political desire to eliminate asbestos [...]. The authorities that had to deal with this situation put life in the background in favour of profit [...]. They have much of the fault! They didn't come to see in what conditions we worked, in the dust! [...] The politicians were inactive and incompetent! But this ignorance is not justifiable.

A particular form of blaming was addressed to the health system:

There was no psychological assistance. Maybe there was the possibility of having it, but I did not know how to access it and no one had given me any advice! I would have liked support to give my husband the right attention, especially from an emotional point of view, because I felt powerless and I needed to trust and confront myself with someone.

In my opinion, occupational medicine is the biggest culprit, since it did not carry out the necessary checks to counteract the company's resistance.

The doctors did not give me the support I needed because they treat you like one of many patients and do not recognize you as a person.

The second prevalent issue was a deep sense of injustice:

I feel so angry because this death was an injustice. Why did this happen to my family? I cannot explain this injustice [...]. I'm angry and desolate at the same time because all that happened in this zone is an injustice. We have no fault or guilt, we are not responsible for all this, but somebody should have prevented this situation!

In our territory, nobody told us that asbestos is dangerous: how can we trust this community? [...] The competent authorities didn't work enough to know the problem, and they should have paid more attention because they surely knew about the gravity of the situation! But they did not inform us! Nobody informed us!

4.3. Bargaining

In the DABDA model, this phase is characterised by the adoption of strategies that give hope of living in spite of everything. The story of Nicola, who was a man of about ninety years, is somehow prototypical. He has worked for many years in several companies, dealing mainly with welding activities, and was proud to have served important companies. He discovered his pleural plates during his last years of working. He did not accept that he, and others like him, may have fallen ill in the workplace and wanted to write to manage the anxiety caused by his awareness of the disease:

When I knew I had the plates, I was very sad. I was afraid and still fear mesothelioma. Those who are sick because of asbestos continue to look for strategies to live. I want to be the spokesperson for the living, describing dead without justice. No construction bricklayer has returned home rich. The luckiest have retired, while the others have died. The memory must not end here. I started writing because we must not forget and to give meaning to this experience. Writing makes me remember and live.

This phase is characterised by two prevalent issues: *hope* and *social strategies for improving resilience*. The first was evident in the actions aimed at avoiding the fact that asbestos disease recurs or was mortal:

I started to testify and be active in the trials. I hoped that it is possible to heal, thanks to scientific experimentation.

When finally I was informed of my asbestos disease I was already conscious of the risks and the possibility of getting sick, but had hoped, avoiding some places or situations.

The second area described the methods people adopted to relieve the anguish caused by asbestos pathologies:

I tried to feel better, negating the sickness by working more and more. When I became aware of the pathology, I decided to react by making the problem known and helping prevent it. Somehow, I hoped this could have helped me. I began to witness and be active in the social initiative to share all information on the problem.

I and other widows became ferocious! We participated in sit-ins, protests, and other activities that the associations organized. I also gave support to those who were living my own experience.

4.4. Depression

In the DABDA model, this phase is characterised by hopelessness and demoralisation. The story of Luigi, a man in his fifties with a wife and two children, is an example of this condition. He learned that he had pleural plaques during a checkup, and since then, his health has begun to worsen, forcing him to retire from work:

Coming to know about the asbestos disease has led to a change in my life. It's like having a lion inside that wakes up and takes your life. I felt fear, fear mainly for the family [...] because the disease affects them. I can't explain how I feel. I feel absent. I have this fixed thought. The disease has changed me. I think negatively of life, and especially of the life of others. I already see myself dead. There are no solutions to asbestos. I'm worried, I'm fixated on this problem. I don't know how to deal with the disease [...]. I'm apathetic towards controls and medical examinations, I avoid them. I don't know how I would react if I got to know that I was getting worse. Also, because I don't know what triggers the disease, I don't know how to behave now.

This phase was composed of two main issues: *hopelessness* and *apathy*. In the first phase, the narratives were as follows:

I couldn't give up on the situation, it has been unbearable, unsolvable. When it happens, you know you can't do anything, you're helpless. You just wait only for something to go wild and you can't do anything. All the emotions collapse into fear of death and suffering. The thoughts are all death-oriented, you cannot overcome them and there's nothing that counts anymore.

With regard to the second phase:

I don't feel understood. Nobody wants to talk about emotions with me at home, but I cannot explain this to anybody. I am thinking negatively of life and especially of my family.

I see myself as lost. There is no way out. I have this in mind. Nothing seems to help me in surviving. When it happens, you know that you can't do anything, you're powerless. You're just waiting for something to go off and you can't do anything. What could I do?

4.5. Acceptance

In the DABDA model, this phase is characterised by the end of any emotion and by resignation. The story of Cristina, a 72-year-old woman, a mother of two and grandmother of three, exemplifies this condition well. Her mother died from mesothelioma:

My mother was in charge of the construction site cafeteria. She started having difficulty breathing and went to visit the hospital. At eighty, she was diagnosed with mesothelioma, and at 86, she died. When I heard about her illness, let's say that I resigned immediately. My mother was old and I could expect her to get sick sooner or later. But asbestos doesn't forgive: when it hits there is nothing to do. I had a strong desire to protect her and not make her suffer [...]. However, I

accepted the loss and I think she did too [...]. In her opinion, it was better to take risks than not to work.

This phase was composed of two main areas of prevalent issues: *resignation between emotional openness and need to work*. The first described the acknowledgement of the drama: 'When you know you have it, you know you have to die. I've resigned to being sick. That's all you have to know and to accept'. Finally, after accepting the irreversibility of the situation, the need to share one's personal suffering with others emerges:

Yes, I would like to talk about it because in the past we have always lived in fear. I always wished to talk about my suffering and terrible experience, but it was almost impossible to find persons who wanted to listen to me.

However, this need is different from the one of the bargain phase because resignation is followed by no attribution of responsibility to anyone and nobody was considered guilty:

The foreman of my group was not responsible because he worked with us, and if he knew I think he would remain there with us to support us.

I'm not sure that the boss really knew the dangers of processing asbestos because he was a worker too. I think that if the heads had known the reality of the facts, they would have taken the necessary precautions.

Legally, the director was responsible, but concretely he also lived in the same work environment. Since he didn't know the situation, he didn't change the conditions in which we worked together [...]. I don't know if someone knew the dangers of asbestos.

The persons in charge of the health authorities have tried to solve the situation: they showed that they were helping [...] that they were here with us, in the same mess.

In this phase, it became clear that people did not feel guilty of having remained there because they needed to work to support themselves and their families:

Workers needed to work, so when they knew the dangers of the area, they didn't know how to go away. They work to need; workers were simple people whose need was to support their family. If they had left the job, how could they have helped their relatives to survive? [...] Although they knew it was dangerous, people needed to work and then they stayed there, they did not abandon the region.

I worked here because I needed money to survive, but also I didn't know where I could go and how [...] with all my family [...]. It was inevitable that we remained here.

5. Discussion

The DABDA model of coping with death was useful. In fact, the qualitative analysis showed that it facilitates the understanding of the complexity of the *solastalgia*. It permitted us to interpret the narratives of both ill persons and relatives of sick/deceased persons because its phases are the same in all kinds of mourning (Kübler-Ross, 1974, 2005; Testoni, 2016). In the *denial* phase, there is shock at the breaking of bad news that is emphasised by the health system's inability to give psychological support to sick persons and their relatives. In this chapter of the solastalgic narratives, a conspiracy of silence dominated the traumatic experience following the breaking of bad news (Zamperini and Menegatto, 2015). Both social and close relationships were managed inauthentically because of the inability to find words to express terror or bewilderment and people who were willing to listen.

In the phase of *anger*, attribution of responsibility emerged, characterised by huge resentment. As many scholars have already shown, technological disasters are frequently followed by disputes about the allocation of blame in the communities, particularly when someone is perceived to be guilty (Norris et al., 2002). The leaders were often identified with their companies and were considered the most responsible for any carelessness. This resentment is intertwined with the *bargain* phase because the attributional style of all the narratives was 'external' and self-blame never emerged. As the literature shows, pointing the finger at specific social groups considered to be the cause of a negative situation leads to an increase in personal sensation of control over reality (Bukowski et al., 2016). According to the psychological models of 'compensatory control' (Kay et al., 2008; Kruglanski and Orehek, 2011), threats that reduce perceived control can motivate attributions to restore control itself and therefore to maintain the perception of the sense, manageability, and predictability of the world in which people live and from which blame and anger may derive (Marjanovic et al., 2009; Merolla et al., 2011; Skitka, 1999; Supiano, 2012; Testoni, Francescon, de Leo, Santini and Zamperini, 2018b). Also, the tendency to attribute negative intentions to those who are seen as enemies increases the perception of control (Sullivan et al., 2010). The asbestos pollution in north-eastern Italy was human-made, and usually these disasters are perceived as more controllable than natural ones (Brun, 1992; Siegrist and Sütterlin, 2014). Furthermore, its slowly evolving effect creates a huge situation of uncertainty. In such circumstances, the most influential and powerful groups are often identified as the cause of the catastrophe, although the dynamics are much more multifaceted (Bukowski et al., 2016). Indeed, the *bargain* phase presented further attempts at controlling the situation, aimed to make sense of the situation and blowing on the last weak flames of hope through a social commitment to informing people. However, even though the perception of control over events increases self-confidence, the ability to go beyond life's difficulties is not enough to activate restoration processes if the community is not really efficacious in giving adequate support (Davydova et al., 2018; Thompson and Schlehofer, 2008). The conviction of living close to unreliable, unhealthy, or indifferent people or even enemies inevitably reduces trust, as well as the sense of security that should characterise the place attachment and the sense of defence from death in the community (Testoni, Bisceglie, Ronconi, Pergher and Facco, 2018a). Indeed, the care-giving community was perceived as absent and unable to psychologically support sick persons and mourners. This is the first level at which place attachment suffered a backlash because the community has not been able to support this tragic condition. The loss of place attachment was expressed with anger derived from the fact that neither political authorities nor sanitarian structures informed the population of the problem, so the territory was finally perceived as weird, unknown, and inhospitable. When there is no efficient territorial policy, the examination of reality can only result in the loss of hope and, therefore, in the *depression* phase, characterised by the absence of any significance. In this perspective, *acceptance* is a matter of course once people understand that any control of the situation is impossible and that dying is the last and inevitable dance in the place where they have been living and working. When this final phase appears, anger disappears and the blaming processes end. Nobody is blamed for having lived or worked or managed work in a contaminated place because the enemy was unknown by either the politicians and bosses or the sufferers themselves. In this situation, when a general remission of responsibility reigns, it is possible to bear the experience of death and dying.

The original idea of developing a reading of the *solastalgia*, on the basis of the disorientation and reorientation process, very similar to the dual process model of mourning elaborated by Stroebe and Schut (1999), resulted partially vain. In fact, the narratives of the participants did not present any content similar to the restoration of meaningful places, which is so crucial for the re-establishment of a personal and community sense of home and protection (Cox and Perry, 2011). All this suggests that the slow effects of asbestos produce a paralysis in

the community that isolates the sick persons, perhaps so as not to create a social alarm that would be difficult to manage. Whereas most disasters are characterised by an acute threat followed by a gradual restoration of order and safety, triggering community responses, as research in the social capital field shows (Williams and Shepherd, 2017), in contrast, the experience of our participants was mainly characterised by the social conspiracy of silence. Because it is likely that the most serious impact of asbestos pollution in this area is yet to become apparent and since disasters may strengthen networks but do not facilitate the creation of new networks in seeking support (Doerfel et al., 2013), the results of our pilot study are useful because they point out that it is necessary to plan the improvement of both social capital networking and psychological support through building communities of practice to create better future resilience. In fact, research in the field of grief and mass tragedies shows how important it is to develop the community by strengthening social capital and solidarity. Based on the analysis of these interviews, it is evident that the denial of the experience of loss due to fear of disease inhibits the growth of support initiatives that are related, for example, to volunteering.

6. Conclusions

Our impression, after this analysis, is that in this territory, people affected by asbestos pollution are disoriented and have turned towards attitudes of loss and resignation without hope. Indeed, in other types of disasters, communities' ability to protect, restore, and mobilize resources activates the resilience and restoration of social ties as well as public and mental health. However, our perception was that these people are not yet part of networks that can reinforce the restoration processes, by involving ill persons, mourners, and others. It is possible to hypothesise that the asbestos pollution disaster, because of its latent pathogenicity, progressively deconstructs the community's ability to deal with danger systematically, and then resignation becomes a generalised form of adaptation to the contamination. The final overall realisation of this study was that there is substantial hopelessness in this area and that the sick persons and their relatives have to manage this invincible and invisible enemy without any psychological support because the situation is still underestimated. These people are loss oriented, without any possibility of achieving generative relationships that allow them to inscribe the meaning of their biography in the history of the place where they have lived and worked. Their perception that the community would not be restored resulted in their own final resignation to the idea that everything was meaningless and inevitable when their place attachment was badly wounded and betrayed. It really seems that neither the politicians nor the sanitarian structures are able to offer adequate interventions and that people live in a substantial condition of uncertainty. Perception of the damage deriving from pollution is deeply related to social and cultural constructs reflecting values, symbols, and ideologies, while information and awareness campaign with regard to this issue reduce uncertainty, being a crucial facilitator of human responses in situations with unknown outcomes. We hypothesise that in this area, the community restoration processes are still blocked by the psychosocial trauma linked to the specific difficulties that asbestos implies. In this scenario, we are clearly faced with what the researchers of terror management theory have suggested, which is that the fear of death is always paralysing and therefore when it is not managed with adequate social skills, it becomes substantially disastrous. Maybe more efficacious informative intervention could help people understand what has been happening and to launch more significant territorial strategies aimed at supporting mourners and sick persons. Probably, however, it is necessary for the Italian state to intervene with important resources that must be made available from outside these territories that are now paralyzed in the face of the problem. In fact, this community needs to be psychologically accompanied towards the activation of new public health management practices.

7. Limitations and further developments

Unfortunately, the limitations of the research are numerous. First, our group of participants cannot be representative of the entire population of people who do not perceive the toxic effect of asbestos pollution. Having had to deal with death and disease caused by this type of pollution is not equal to not having to cope with all this yet. Future research could identify the presence of solastalgia. Furthermore, we are convinced that it is very useful to further develop research in this direction to provide appropriate psychological support both to communities and individuals. The second limitation of the study was that we did not consider in-depth the relationships between social and personal identity related with place attachment. Future studies might survey the different forms of solastalgia with regard to the constellation of identities that characterises the reasons for staying in a polluted area. Additionally, we think that further studies on the social representations of asbestos could be useful to developing a strategy for activating balanced awareness policies that do not create social alarm and that activate solidarity.

Declarations

Author contribution statement

I. Testoni, L. Mauchigna, G. L. Marinoni, A. Zamperini, M. Bucuță, G. Dima: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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