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*Article*

# Community Resilience after Disasters: Exploring Teacher, Caregiver and Student Conceptualisations in Indonesia

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**Abstract:** Despite the potentially catastrophic nature of disasters, survivors can be highly resilient. Resilience, the capacity to successfully adapt to adversity, is both individual and collective. Policymakers and academics have recently emphasised the importance of community resilience, but with little consideration of local survivors' perspectives, particularly young survivors within low- and middle-income countries. Therefore, this exploratory study aims to give voice to disaster-affected caregivers, teachers and female adolescent students by examining their conceptualisations of community coping and priorities for resilient recovery following the 2018 Central Sulawesi earthquake and tsunami. A total of 127 survivors of the devastating disaster, including 47 adolescents, answered open-ended survey questions related to post-disaster resilience. A content analysis identified key constituents of community resilience. The results indicate that survivors highly value community cohesion and participation, drawing on the community's intra-personal strengths to overcome post-disaster stressors. Student conceptualisations of and recommendations for a resilient recovery often differ from the views of important adults in their lives, for example, regarding the role played by the built environment, "*trauma healing*" and religiosity in the recovery process. These findings have implications for the design of disaster resilience interventions.

**Keywords:** disaster; post-disaster recovery; resilience; community resilience; community perspectives; open-ended survey questions; intervention development

## 1. Introduction

A rise in the intensity and effects of disasters in recent decades has led to a surge in resilience research [1]. Individual resilience is a well-established concept in psychological literature; it refers to the ability of an individual to return to normal functioning or thrive despite adversity [2–4]. There is growing consensus that resilience is attributed to an interaction between individual differences in characteristics (e.g., optimism, self-efficacy), relational attributes (e.g., secure attachment relationships) and the structures, services and environmental resources that facilitate positive development (e.g., neighbour safety, positive school experiences and other high quality service provision) [3,5]. However, disasters also cause community-wide disruption due to shared experiences of loss, damage to buildings, infrastructure systems, the economy and the availability of services [6]. Such disruption takes a toll on the physical and mental health of community members. Enhancing the collective resilience of the *community* is one form of mitigating the negative impacts of disasters [7]. Nevertheless, existing approaches and interventions that aim to enhance

community resilience have been criticised for adopting a top-down conceptualisation that lacks local perspectives [8]. In this light, this study aims to explore local survivor conceptualisations of community coping, strengths and priorities for a resilient recovery 40 months after a devastating earthquake and tsunami in Palu, Central Sulawesi, Indonesia.

### 1.1. Conceptualising Community

"Community" has been conceptualised in community resilience studies in various ways but is rarely critically explored. Our approach to community is based on the notion of a shared place (e.g., geographical area and institution), disaster experience, identity or culture, which is in line with other studies of community resilience [9,10]. However, we recognise that communities are dynamic and not necessarily geographically bound [11]. While a community can represent a place (i.e., a geographical location or shared institution), communities can also be systems of practice (i.e., belonging to a shared activity or profession), diagnostic identity (i.e., mental health condition) and other symbolic relationships (i.e., meanings and experiences with shared community life), such as spiritual-/faith-based support [12]. Therefore, disaster survivors can belong to multiple communities (see [11]).

### 1.2. Psychosocial Impacts of Disaster: What Do Communities Need to Be Resilient to?

It is important to acknowledge the mental health burden of disaster-related stressors for communities. The psychological impacts of disasters occur through the direct effects of the extreme event (primary stressors) (e.g., witnessing the collapse of buildings and experiencing physical injuries) and the knock-on consequences of disaster (secondary stressors) (e.g., employment loss, loss of identity and disturbance to community roles) (see [13] for a review). Secondary stressors can impact mental health and well-being in similar ways to the initial disaster exposure [14], influencing the long-term mental health burden of disasters. This includes the impact of collective trauma (i.e., the group-level experience of an acute fear of death or injury for oneself or others), which can harm individuals' psychological functioning and therefore the social fabric of the community [15,16].

The extant literature has focused on the individual mental health outcomes among communities of diagnostic identity, such as post-traumatic stress disorder (PTSD) [17]. PTSD following disaster exposure is among the most studied mental health disorders (for reviews, see [18,19]). However, disasters also produce an increase in experiences of grief, depression, anxiety, suicidal ideation, substance abuse and other stress-related problems. Some manifestations of the psychological impacts of disasters may vary between Western and non-Western cultures. For example, after the 2004 tsunami in Sri Lanka, trauma was often expressed via somatic complaints, such as headaches and bodily pain [20].

Young people are particularly vulnerable to the negative impacts of disasters. In a seminal review of twenty years of disaster literature, Norris et al. [19] found that the psychological impairments of young people were elevated and extreme compared to adults. More recent studies support the idea that younger age is associated with elevated PTSD symptoms (e.g., [21–25]). Economically disadvantaged young people are likely to have fewer resources to cope with disaster stressors, therefore heightening their risk [26]. They are also more likely to experience chronic or multigenerational trauma pre-disaster, which is exacerbated by the impacts of disasters [27]. The risk factors for PTSD in children that were identified in a review of eight studies include female gender, disaster exposure, negative coping and lack of social support [28]. Many reasons have been suggested as to why girls may be more vulnerable to the impacts of disasters. These include gender differences in cognitive appraisals of threat [29,30], gendered vulnerability to the consequences of disasters, such as a rise in violence, increased mortality risk and economic vulnerability [31–33]. Alternatively, the putative greater vulnerability of girls to the impacts of disasters may be a consequence of the gendered expectations of adults (i.e., parents and teachers), who often complete quantitative measures on behalf of their children [26]. Such expectations may also determine that girls carry the burden of domestic chores and caring responsibilities post-disaster, which can impede their return to schooling post-disaster [34]. This empha-

sises the importance of research that directly gauges the experiences of girls, particularly from marginalised communities.

*1.3. Resilience to Disasters: From the Individual to the Community*

Despite extensive research focused on the mental health impacts of disasters, in most circumstances, disasters do not lead to serious, long-term psychological impairment. Methodological limitations such as sampling biases have led to a historical overreporting of dysfunction in trauma research [35]. More recent, innovative techniques using longitudinal trajectories of disaster survivors have shown that sustained psychological challenges rarely exceed 30% [17]. Studies such as those by Bonanno et al. [17] and Masten and Narayan [36] review the multiple factors that promote adaptive, resilient functioning after disasters at the individual level. This includes individual differences, such as personality and beliefs, cognitive appraisal processes and social resources, which interact to guide the coping strategies that an individual employs when experiencing adversity [37]. However, resilience research has attracted criticism for promoting a neoliberal agenda that neglects the structural inequalities that impede the resilience of individuals [38,39].

An alternative approach is to explore resilience as a collective phenomenon that operates at the level of the community [40]. Community resilience has been defined in several ways, but researchers generally agree that such resilience is an "adaptive capacity" that supports the community to cope with adversity (e.g., [10,41,42]). Norris and colleagues' [10] well-cited model theorises successful community adaption as a process emerging from four adaptive capacities: economic development, social capital, community competence and information and communication. The model has been referenced in many studies exploring resilience in non-Western contexts (e.g., [43–45]).

Although community resilience is far less extensively researched in psychology than resilience at the individual level, there is a historical precedent in psychological research for considering the strength-oriented responses of communities to disasters. Research on high-income settings has long shown that in public emergencies, communities come together to overcome adversity (e.g., [46–48]). Numerous terms have been used to describe the positive affinity shared between groups who experience collective adversity, including "brotherhood of pain" [48], "altruistic communities" [49] and "therapeutic communities" [50]. Social psychologists have interpreted these collective responses through the lens of the social identity approach [51]; this explains the cohesion, solidarity and coordination that occurs in the face of adversity as the product of a shared "disaster survivor" identity [52–55]. However, most research in this area focuses on the immediate disaster response, while the community dynamics that facilitate (or impede) long-term recovery are rarely explored. The research that exists in this area yields mixed results: Ntontis et al. [56] reported that after flooding in the UK, secondary stressors promoted community support beyond the initial emergency, whereas Paton et al. [57] found that after the Christchurch earthquake, community groups were transient and dissipated once their survival needs had been met. However, there is a notable absence of research in this area from non-Western contexts. Research in non-Western contexts is important, as cultural belief systems and practices influence processes of coping and adaption to adversity [58,59]. Therefore, while some determinants of resilience may resonate cross-culturally, their presentation and impact can be context-dependent and culturally nuanced [59,60].

*1.4. Building Back Better: According to Whom?*

In tandem with the rising popularity of the concept in psychological literature, resilience has become a policy buzzword in disaster risk management since the development of the Hyogo Framework for Action 2005–2015 [7]. The more recent Sendai Framework for Disaster Risk Reduction 2015–2030 [61] was developed to build the resilience of nations and communities to disasters. Beyond early definitions of resilience connotating a "bouncing back" following an external shock [62], the more recent disaster literature emphasises the need to bounce back *better* [63]. The "*Build Back Better*" agenda argues that disaster relief

should be coupled with long-term development objectives to reduce vulnerabilities to future natural hazards as a "new normal" is sought [64]. This means that the discourse of resilience can bridge the gap between humanitarian crisis intervention and longer-term sustainable development goals [65]. However, it is important to note that despite the compelling narrative of "*Build Back Better*" that is promoted extensively following disasters, long-term development projects are not always delivered in practice, particularly in countries that are fragile and experience weak governance, as seen following the devastating 2010 earthquake in Haiti [66,67]. More recently, the "Building Back *Fairer*" agenda asserts that disaster response must prioritise social equity to reduce the structural drivers that exacerbate inequality, making marginalised populations particularly vulnerable to the negative impacts of disasters [68].

However, the concept of resilience in disaster management runs the risk of becoming a set of top-down attributes decided by international agencies [69]. Since a hazard becomes a disaster due to an interplay of social, political and economic factors that shape the vulnerability of the community [70], it is the most marginalised, poorest communities who are likely to experience the most negative impacts. Therefore, such voices should be at the forefront of interventions designed to strengthen community resilience. This must include children, who suffer the most and have been recognised for their potential to actively contribute to community recovery and resilience (e.g., [71]), but whose voices are rarely included in research. Therefore, this paper aims to support the commendation of Hajir et al. [72] that researchers should facilitate the global south (i.e., lower middle-income countries) in "speaking back" on what resilience means to them.

### 1.5. Study Context

This study focuses on the disaster-displaced residents of Palu in Central Sulawesi, Indonesia. Indonesia, the largest archipelagic state in the world, is classified as a lower middle-income country [73] that is geographically prone to seismic hazards. On 28 September 2018, an earthquake measuring 7.7 Mw with a depth of 10 km caused a tsunami in Central Sulawesi [74]. This triggered liquefaction and landslides that further exacerbated infrastructural damage and the loss of life [75]; 4340 people died, 211,000 people were displaced from their homes and moved to temporary shelters and 373 schools sustained major damage [76]. While the recovery period is on-going, there has been little psychological research regarding this disaster, and less that examines community resilience.

### 1.6. Summary and Aims of the Study

Southeast Asian countries are underrepresented in the current academic literature on post-disaster mental health, coping and resilience, despite being one of the most geographically disaster-prone regions globally [77]. Much existing research from Southeast Asia centres on the devastating 2004 Indian Ocean tsunami (e.g., see [78,79]). Furthermore, in psychological literature, studies of resilience have been dominated by an analysis at the level of the individual (e.g., [17]). This may reflect a Western tendency to interpret distress through an individualist rather than a collectivist lens. Shifting the analysis of resilience to the unit of the community may be a step towards overcoming an ethnocentric bias in resilience research [40]. Moreover, the existing qualitative research that examines resilience at the level of the community explores the views of "experts" (i.e., researchers, emergency managers and policy makers) [1] or takes place in high-income contexts, such as New Zealand and Australia (e.g., [80]). An exception to this is the work by Murphy et al. [8], who investigated the non-Western perspective of local survivor views on community coping, adaptation and transformation after disaster to identify six mechanisms of survivor-led resilience: psycho-social support, early livelihood support, community empowerment, community cohesion, government collaboration and addressing the root causes of vulnerability. This work is valuable for intervention development, as resilience building interventions should be contextually nuanced by incorporating the lived realities and desires of participants [81] and should aim to harness and strengthen existing

community capacities [82]. Furthermore, these findings can act as a starting point for a large-scale traditionally quantitative study in the region or for a mixed-methods approach to triangulate the findings. This is consistent with conducting a feasibility study to select or develop valid psychometric scales. To expand on the findings of Murphy et al. [8], this study examines the conceptualisations of caregivers, teachers and female adolescent students regarding community coping and priorities for resilient recovery following a devastating disaster.

Overall, this exploratory feasibility study aims to explore a community's key constituents of post-disaster resilience via three research questions (RQs):

1.  How has the community coped with post-disaster challenges?
2.  How does the community conceptualise a strong post-disaster community?
3.  What does the community recommend for a resilient future?

## 2. Method and Materials

### 2.1. Participants

The aim of this study is to understand the post-disaster community needs and priorities for a resilient recovery according to three groups of key educational stakeholders: teachers, students and their caregivers. These participant groups were chosen since the aim of the project that this study forms a part of is to harness schools' capacity as hubs that can foster disaster resilience. Therefore, participants are united by the common thread of the institution of the school as a place-based community, as well as their shared experience of the disaster, which may have implications for their identities as "disaster survivors". However, we recognise that the school may be the meeting place of multiple communities, such as symbolic or diagnostic communities. A non-probability quota sampling strategy was used to recruit 127 participants (40 parent–child dyads (n = 80), 7 additional students (students, n = 47) and 40 teachers) from 3 sites in the region of Palu via schools. The three sites were chosen because they had experienced extensive damage during the 2018 earthquake and tsunami disasters; particular attention was given to accessing communities that are not always "heard" in research, such as members of remote, geographically isolated fishing communities and mothers with low levels of education. While an equal number of teachers, caregivers and students were originally recruited, due to logistical difficulties in arranging data collection for caregivers and teachers (related to work and childcare commitments), a sample size of n = 40 per adult group was deemed sufficient. As students' data were collected in schools, streamlining the data collection process, the final sample was larger for students (n = 47). These samples are relatively large for qualitative research, which is consistent with previous disaster research that analyses qualitative data for three participant groups (e.g., [83]). As each group featured similar numbers of participants, this allowed for valid group comparisons.

Participant demographics and details regarding exposure to the disaster are included below (Table 1). All participants were exposed to the 2018 disaster, most felt the shaking and a small number witnessed the tsunami and liquefaction. Most participants' homes were damaged; however, they experienced varying degrees of loss (e.g., death of family member or friend).

**Table 1.** Demographic information and exposure indicators.

|  | Teachers (N = 40) | Caregivers (N = 40) | Students (N = 47) |
|---|---|---|---|
| Age (years) | 27–59 (M = 49) | 25–57 (M = 43) | 14–15 (M = 14) |
| Marital status | Married: 87%<br>Single: 8%<br>Widowed: 5% | Married: 98%<br>Divorced: 2% | N/A |
| Gender (% female) | 88% | 93% | 100% |

Table 1. *Cont.*

| | Teachers (N = 40) | Caregivers (N = 40) | Students (N = 47) |
|---|---|---|---|
| Highest education completed | 80% Postgraduate degree<br>18% None of the above | 60% Senior High School<br>18% Junior High School<br>13% Postgraduate Degree<br>8% Elementary School<br>3% Undergraduate Degree | N/A |
| Religious | 95% Muslim<br>5% Christian | 90% Muslim<br>10% Christian | 81% Muslim<br>13% Christian<br>6% Other |
| Household income (per month) in Indonesian Rupiah | 32% Less than IDR 4 Million<br>45% IDR 4–6 Million<br>19% IDR 6–8 Million<br>11% IDR 8–10 Million | 3% No Income<br>73% Less than IDR 4 Million<br>20% IDR 4–6 Million<br>0% IDR 6–8 Million<br>3% IDR 8–10 Million | N/A |
| Disaster exposure (%) | | | |
| Experienced shaking | 100% | 100% | 96% |
| Home was damaged | 88% | 93% | N/A |
| Separated from household family | 76% | 65% | 66% |
| Lost a close person | 63% | 55% | 57% |
| Witnessed grotesque scenes (e.g., bodies) | 54% | 50% | 40% |
| Injured | 37% | 28% | 45% |
| Saw liquefaction | 34% | 15% | 28% |
| Heard voices trapped under debris | 29% | 20% | 30% |
| Saw tsunami | 12% | 15% | 23% |
| Trapped under the debris | 17% | 10% | 11% |

Teachers generally reported a higher monthly income and education level than caregivers. Male teachers and caregivers were not excluded; however, due to the female-dominated teacher workforce and gendered caregiving responsibilities in Indonesia, the sample was predominantly female. Adolescent girls were selected as this study forms one component of a larger interdisciplinary project to foster resilient post-disaster recovery psychosocially and by improving water sanitation and hygiene (WASH) for girls. Girls were exclusively included in this wider project due to their vulnerability to adverse psychological outcomes and inadequate post-disaster WASH facilities (see [84]). Therefore, this is primarily a study of female conceptualisations. Female perspectives are particularly vital considering the post-disaster risks that disproportionately impact women (see Section 1.2).

### 2.2. Procedure

Three schools were recruited via contact with principals. Once permission for the research had been given by the school principals, teachers and caregiver–child dyads were randomly contacted and invited to participate. All participants in the study were provided with information sheets to read regarding the nature of the project and gave informed consent. For students, consent was sought from both them and their caregivers. Prior to data collection, the survey questions were piloted with two members from each participant group (n = 6). Minor changes were made to the student questions following piloting (see Section 2.3). All questions were reviewed for clarity and coherence by local researchers before being professionally translated/back-translated from English to Bahasa Indonesian to ensure the correct meaning was maintained. A bilingual English–Indonesian researcher rectified any differences.

Data for this study were collected by local research assistants who delivered the survey through a face-to-face data collection technique. Data collection took place in schools for teachers and students, and in a location of the caregiver's choice, which was sometimes their child's school, but usually their home. To complete the survey, research assistants offered participants the use of an electronic tablet or a paper version of the survey, as they were aware that some participants may not be comfortable with the use of technology. Most participants completed the survey on paper; research assistants subsequently entered the data into the "KoboToolBox" (www.kobotoolbox.org) open access data collection software for data to be shared with the international research team. Each participant's data were given a unique, anonymous identifier to ensure confidentiality and anonymity. Following data collection, each participant was thanked for their time and provided with an age-appropriate gift in appreciation for taking part in the study.

Alongside the survey, participants completed a series of psychometric scales and in-depth interviews on how they had coped and the role of the school in supporting post-disaster coping. The interviews used a free association method, exploring participants chains of stored associations (i.e., their most immediate thoughts) regarding coping, with minimal researcher input; therefore, the interviews did not aim to elicit visions or recommendations for a resilient community, which is the focus of the present study. As psychometric scales to measure resilience rely on pre-determined categories, derived from Western conceptualisations of resilience, these quantitative measures did not allow us to capture the socially and culturally specific dimensions of community resilience [85], as is the aim of the paper. Therefore, the results of these complementary measures are beyond the scope of the present study. A systematic analysis of open-ended questions from the survey is presented here, as it is most relevant to the aim of this paper. Open-ended survey questions were selected as they allow for qualitative data to be collected from a reasonably large sample in a way that is less burdensome to participants than interview methods, which is especially important in a resource-poor, post-disaster context. Additionally, while most surveys contain open-ended questions, as observed in published research, the results are rarely systematically analysed or reported.

Ethical principles were followed, including confidentiality, anonymity and causing no harm to participants. Participants were told they could withdraw themselves or their data at any time. Research assistants were residents of the same region as the participants and therefore had an understanding of local cultures and values. As employees of a local mental health NGO, the research assistants were also adept in noticing signs of possible discomfort and could offer and/or signpost appropriate, culturally sensitive support, if necessary. The UCL Research Ethics Committee approved this research (Project ID: 0525/001).

### 2.3. Measures

Participants were asked to complete a series of open-ended questions influenced by the "coping-adaptation-transformation" interview schedule developed by Murphy et al. [8]. The questions were asked as part of a larger survey. Teachers and caregivers were asked the same questions, and students were asked a modified version involving a creative element to increase engagement. For example, young people were asked to imagine that they were giving advice on how to cope with the disaster, and that they were the mayor tasked with improving their local area. During piloting, the term "*community*" was found to be confusing for the students in certain contexts (i.e., when asking about community coping), so students were instead asked about "*you and people you know*". By asking students to imagine being the mayor and to give advice to another student on how to cope, the questions aimed to elicit students' conceptualisations of their *community*'s resilience, rather than to reflect exclusively on their own individual, personal experiences. This also aimed to minimise the potential distress that reflecting on their own disaster experiences could cause, as the questions maintain a distance from personal vulnerabilities while still engaging with their conceptualisations of community resilience. The questions were also designed to be less abstract for students; for example, students were asked about what the community

*had done well* since the disaster, whereas adults were asked what a strong community *would look like*. While these questions may elicit slightly different content from each participant group, they were designed to centre around the same overarching themes (see Table 2). The questions asked participants to reflect on "*since*" and "*after*" the disaster, as the post-disaster recovery period is on-going, and we did not want participants to feel limited to memory by only retrospectively recalling their initial disaster experiences. Furthermore, the questions focused on eliciting participants' *conceptualisations* rather than the accurate details regarding their disaster *experiences*.

**Table 2.** Survey questions.

| Question Domain | Respondent | Question |
| --- | --- | --- |
| Coping | Adults | How has your own community coped since the disaster? |
| | Students | Imagine a student your age is asking you for advice about how to feel better after a disaster. Based on how you and people you know dealt with problems after the 2018 disaster, what advice would you give? |
| Visions of a strong community | Adults | What would a strong community here in Palu look like after disaster? |
| | Students | As Mayor, what do you think your community has done well since the disaster? |
| Recommendations | Adults | What would you recommend to make your community stronger for the future? |
| | Students | Imagine you are the mayor of Palu and are in charge of improving Palu after the 2018 disaster. What would you change to make life better for the people who live here? |

*2.4. Data Analysis*

A content analysis was conducted. This method involves the categorisation, counting and evaluation of key symbols or themes that occur [86]. This method was chosen because it provides a useful, systematic method to analyse a large dataset [87]. This is particularly pertinent as the sample (n = 127) is considered large for qualitative research [88].

Immersion in the data is the widely agreed first stage of content analysis [89], which the first coder achieved through a process of reading and re-reading the data. The data were interpreted via an inductive approach to allow for novel content and patterns in the data to be explored. Although we considered coding responses in accordance with the four adaptive capacities of community resilience presented by Norris et al. [10], we found that many of the responses did not fit this categorisation neatly. Furthermore, using an inductive approach allowed the coding frame to be driven by the data, which was consistent with our aim of listening closely to the voices and experiences of hard-to-reach groups. The same coding frame was applied to all three question domains since, together, they covered how the community conceptualised post-disaster resilience (see Appendix A). Responses were assigned to more than one category when they clearly belonged to both (e.g., the response "*Doing activities to open a business and also while helping each other*" was coded as "economic and livelihood" and "community participation and cohesion"). Excel was used to apply the coding frame to each participant's response due to the short length of the written responses and the emphasis placed on frequency counting in content analysis.

A second coder with no knowledge of the project at the time of coding independently coded approximately 10% of the data, as recommended by O'Connor & Joffe [90]. The datasets were exported into SPSS, and a Cohen's Kappa analysis was performed. We achieved an average Cohen's Kappa of 0.81 (range = 0.71–0.91), indicating substantial reliability [91]. The identified discrepancies were resolved, and based on dialogue between the researchers, the coding frame was amended for clarity.

**3. Findings**

We describe our findings by presenting the content analysis results that are relevant to each research question in turn.

RQ1. How has the community coped with post-disaster challenges?

In this section, we report the findings regarding how participants stated they coped with the disaster (see Figure 1).
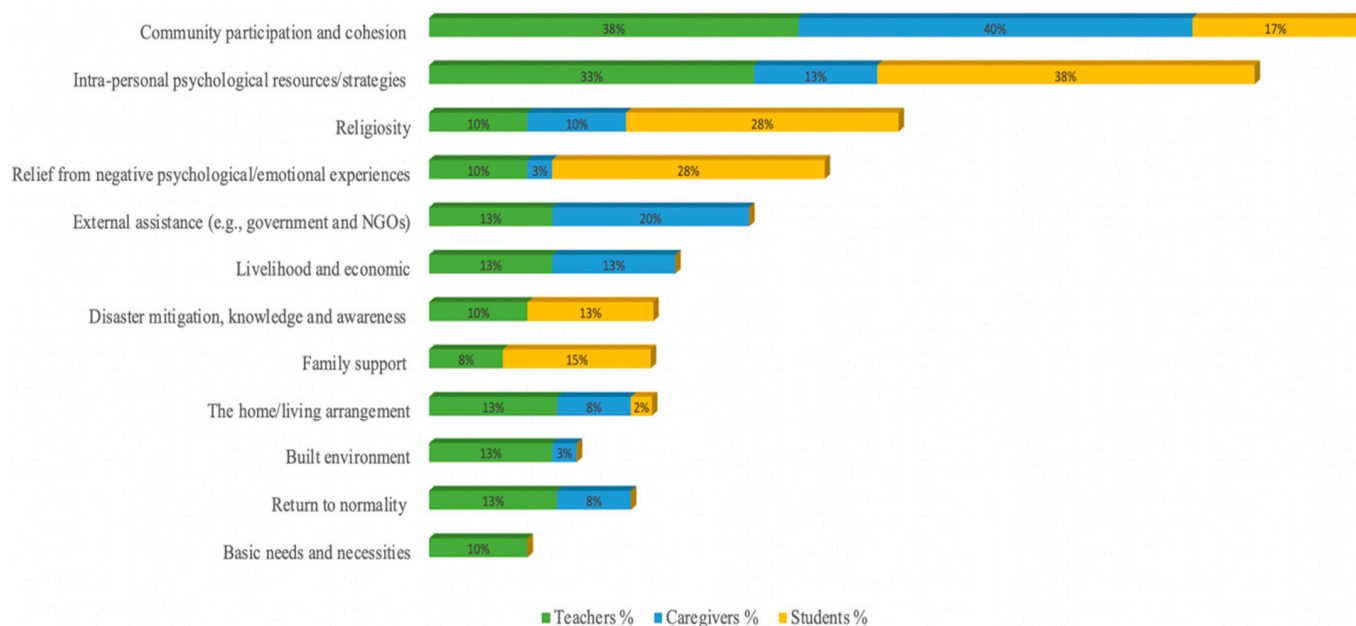


**Figure 1.** Coping with the disaster.

For both adult groups, the most frequently reported coping strategy was related to community participation and cohesion, mentioned by over a third of the teachers and caregivers. Provisions of mutual assistance (locally termed "*Gotong Royong*") was frequently mentioned as an aspect of this. Mutual assistance was often discussed regarding reciprocally provided instrumental support and practical actions to reduce the community's disaster stressors, such as "*Gotong royong to find necessities such as food, drink and evacuation equipment...*". Mutual assistance occurred naturally but was also fostered by a government-run institution ("*Rukun Tetangga*" *(RT)*), which aimed to promote the smooth running of social and developmental initiatives. For example, "*RT helps the community to participate in the environment*". Mutual social and emotional support and encouragement were also salient in the adults' responses. For example, one response was "*give each other support and encouragement so as not to linger in the earthquake incident*". Another participant mentioned that this form of support "*...strengthens one another...*".

The category was mentioned less frequently by students. When students referred to community participation and cohesion, they often mentioned members of their support network, including friends and teachers, rather than the wider community. For example, a student stated, "*...we must be open both with family, close friends and teachers at school with what we feel...*".

Intra-personal psychological resources and strategies were often referred to by participants as supporting them with coping. This was the most frequent coping strategy referred to by students, mentioned by over a third of them. It was also prevalent among teachers, but less salient in the caregivers' responses. Qualitatively, the responses within this category of content differed between adults and students. The adults' responses focused on their ability to face challenges and maintain a positive mental outlook, such as demonstrating strength, enthusiasm and rising to overcome adversity, whereas the students were more likely to discuss strategies to regulate their emotions. For example, demonstrating coping via a positive outlook towards engagement in post-disaster recovery, a teacher wrote: "*strive to rise and be sincere. Enthusiasm and strength to repair the rubble*". The students' intra-personal psychological strategies included exercising emotional control by keeping calm to avoid panic, such as "*first I will invite him to stay calm because if we are calm we will feel better*", and avoiding rumination, such as "*don't think too much about the earthquake because it can*

*stress us*". Often, intra-personal psychological resources/strategies were referred to as collective phenomena rather than an individual phenomenon by both students and adults. For example, a student advised coping by "*keep getting better and rise together*". Similarly, a teacher wrote the following: "my *community is trying to get up and be strong*".

Religious coping was also salient for students, featuring in over a quarter of the students' responses. The responses mainly referenced religious diligence, such as "*pray 5 times a day*". Other comments included "*...asking God for help*" and "*...forgiveness...*". Religious beliefs also supported students to stay calm, due to "*trust in God...*" and a belief that there is "*no need to panic because Allah SWT* [Subhanahu wa ta'ala, a form of respect to God] *will protect his servants*". In the adults' responses, religious coping often involved collective activities; for example, a caregiver wrote "*...dhikr [prayer] together on Talise beach every Friday*". Religious institutions also provided instrumental support. For example, a caregiver wrote that "*the church provides assistance in the form of groceries and money*".

Strategies to relieve and support negative psychological and emotional experiences were the most prevalent in the students' responses, mentioned by over a quarter of the students. These mentions were less prevalent among the teachers and even more scant in the caregivers' responses. This included students' mentions of a general desire to "*reduce trauma*" as well as coping with trauma reactions via professional psychological support, such as "*...trauma healing*". Students also mentioned the psychological benefits of social support, for example, that one should "*play with your friends and family so that the trauma after the 2018 earthquake will disappear*". The responses also featured techniques to self-regulate trauma reactions, such as cognitive avoidance, for example, "*...don't think about the trauma*" to avoid the disaster becoming "*...a burden on your mind*". Often, strategies to regulate emotions co-occurred with religiosity. For example, one response mentioned "*don't panic, keep praying for protection and health, and keep [away] the thoughts that make you afraid and anxious*".

The less frequently mentioned coping strategies included support from external assistance (e.g., government and NGO support), particularly in the immediate aftermath of the disaster. This area was mentioned nearly exclusively by the adults, particularly the caregivers. The adults often referred to dependence on aid in the "*...early days after the incident...*", including receiving supplies to meet basic needs, such as "*...food, drink and clothing assistance...*" and support from the government for "*...damage repairs...*". Similarly, coping through actions to improve livelihood opportunities and economic improvement was mentioned equally by teachers and caregivers, but this was absent from the students' responses. Economic coping strategies included "*...trying to find work to make ends meet*" and diversifying employment through novel business opportunities, such as "*doing activities like making chips for business*".

Enhancing disaster mitigation knowledge and awareness was mainly referred to by the students (e.g., "*carry out activities that can overcome the impact of the disaster. Like preparing equipment that can be used when a disaster occurs*") and by slightly fewer teachers. The students' responses also differed from those of the adults as students mentioned family support more often, including avoiding family separation and spending time together (e.g., "*get together more often with family*").

RQ2. How does the community conceptualise a strong post-disaster community?

The results of the participants' conceptualisations of a strong post-disaster community are reported in Figure 2.
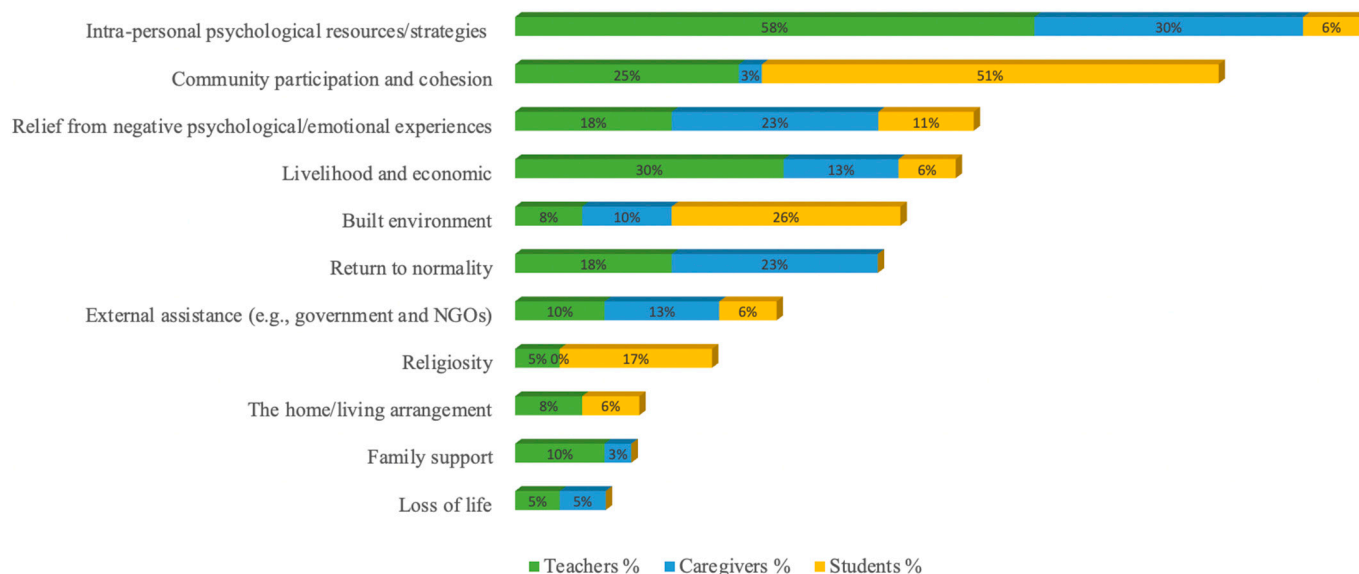
**Figure 2.** Conceptualisations of a strong post-disaster community.

When the participants were asked about their conceptualisation of a strong post-disaster community, the most prevalent response among the adults referred to intra-personal psychological resources and strategies. This strength was mentioned by nearly twice as many teachers than caregivers and only occasionally by students. This included the belief that the people of Palu are internally strong. For example, one adult said "*the people of Palu are generally quite strong in dealing with this disaster or the 2018 earthquake. They don't fall for long and can get up quickly*". The term "*rising*" was used often, with participants expressing that being "*...mentally strong...*" enabled Palu residents to "*...rise up and move forward for the better*". Often, the adults' responses were characterised by an orientation towards the future. For example, a caregiver expressed that the post-disaster community's strength will enable Palu to be "*...even better in the future*".

Community participation and cohesion was valued by all groups, but particularly by students, for whom this was the most prevalent response, as mentioned by over half of the sample. Within this category of content, the students discussed altruism (e.g., "*by helping others...*"), friendships (e.g., "*...strengthening friendships*") and mutual assistance, known as "*gotong royong*" (e.g., "*gotong royong...*", "by *working together...*" and "*let's support each other*"). While this was less prevalent in the participants' *recommendations* for a strong community (see Figure 3), this is likely to be because participants already feel that this *is* a strength of the community (see Figure 2). Mutual assistance was often referenced in tandem with the need to repair the damaged material environment, including the infrastructure and mosques and homes. For example, some students wrote "*repairing houses, working together to clean houses that have been destroyed, strengthening friendships*" and "*after the disaster was over, the community worked together to clean the roads and mosques that were covered with mud and stones*". The capacity of the community to collectively rebuild and repair the physical built environment was central to students' conceptualisation of a strong post-disaster community, but it was featured comparatively rarely in the adults' responses. The students were mainly concerned with the removal and "*...clean up...*" of the disaster debris. They also mentioned the general repair of damaged places, infrastructure and public facilities, including mosques.
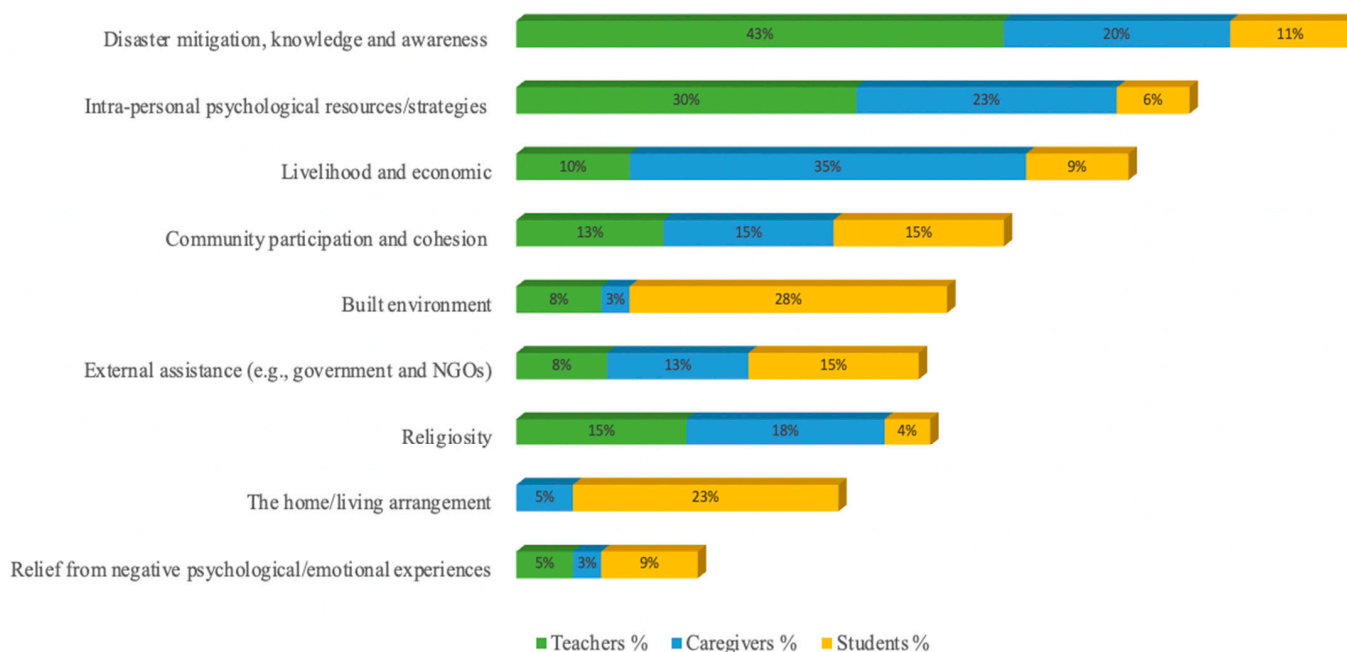
**Figure 3.** Recommendations for improving Palu's resilience.

The third most salient aspect of the conceptualisation for a strong community referred to a desired reduction in negative psychological/emotional experiences, which was mentioned more often by caregivers and teachers than by students. These responses referred mainly to experiences of "*trauma*. . ." and ". . .*fear*. . .". The caregivers' responses indicated that negative psychological and emotional experiences continued to be pervasive in the community, as ". . .*there are still many fears*". Another caregiver expressed that distressing emotions can underlie survivors' external presentations of strength: "*The people of Palu look strong, but behind the strength felt by the people of Palu, they are also sad to be left by their families who were hit by the tsunami*". Other caregivers considered adverse psychological reactions, such as trauma, to disproportionally affect specific vulnerable groups, including the elderly and residents of regions with high death tolls. However, other participants referred to the relief of trauma with the passage of time, as a caregiver wrote: "*the old trauma just disappeared and [we] can return to activities*".

Students were more likely to mention religiosity when conceptualising a strong post-disaster community than either adult group. Their responses mainly referred to increased diligence to acts of worship, for example, to "*pray more often*" and ". . .*pray with orphanage children*". Other students mentioned behaving in accordance with desired religious standards (e.g., "*Pray 5 times, don't gamble*" and "*strengthening religious knowledge*").

RQ3. What does the community recommend for a resilient future?

The participants' recommendations to build Palu's post-disaster resilience are reported in Figure 3.

All groups recommended improving disaster mitigation, knowledge and awareness to create a strong community. This was mentioned most often by teachers compared to caregivers, and it was mentioned less frequently by students. The teachers and caregivers often gave broad responses related to the need for disaster preparedness, such as for the community to "*be prepared*. . .", "*always be aware*. . ." and "*always be alert*. . .". Some teachers gave more specific recommendations, such as the need to implement community training due to the on-going seismic vulnerability of the area. For example, "*there needs to be assistance and training for disaster preparedness because our area is on the Palu Koro fault*". At times, the participants wrote about intra-personal psychological resources and disaster mitigation simultaneously; for example, a participant recommended to "*build a stronger mentality that is ready to face any disaster (with disaster mitigation)*". The students provided suggestions to reduce vulnerability to future disasters, including implementing ". . .*new*

*regulations make the community more advanced*" and a soft-engineering strategy to mitigate flood risk, such as "*planting mangrove trees*".

Recommendations for the community to demonstrate intra-personal psychological resources were prevalent in both adult groups' responses, but they were rarely mentioned as recommendations by the students. The adults' responses included the need to "*stay strong. . .*", demonstrate "*enthusiasm for life ahead. . .*" and "*. . .keep the spirit for the future*" This was often mentioned alongside actions to promote community cohesion, such as the need to "*. . .strengthen each other. . .*". However, the students were slightly more likely to recommend professional psychological support to relieve negative emotional and psychological experiences, such as "*. . .trauma healing. . .*". Often, this was cited in conjunction with other practical recovery activities, such as "*maybe first do trauma healing, then invite the community to fix the city again*". Some responses referred to the need for trauma support for specific groups. For example, a student suggested that children required trauma counselling and recommended "*helping the community to repair completely damaged houses, providing business funds, providing a place for trauma counselling, especially for children*". A teacher highlighted the need for support to reach the less accessible regions by recommending that the local government provide "*. . .healing institutions and socialization activities for disaster management to remote areas of Palu*".

Recommendations to support livelihood and economic sufficiency were mentioned by over a third of the caregivers, but this was not prevalent in the students' responses. Most saliently, this related to actions that would increase employment. Often, this included the desire for financial support to "*. . .open a business*". Both the caregivers and teachers recommended training to increase community members' employability and therefore reduce their dependency on assistance, including an emphasis on "*entrepreneurship training. . .*" and more general calls to "*provide skills and tutoring. . .*" and "*. . .to increase skills in all fields for the community*".

Often, the students' recommendations differed substantially from those of the adults. The students most often recommended the repair and rebuilding of damaged infrastructure and improving the community's housing and living situations, whereas similar recommendations to improve the built environment were rare among both adult groups. For example, a student recommended "*repairing roads, repairing houses of people affected by disasters*". As well as roads, students mentioned a range of infrastructure that would benefit from repair, including a central bridge to improve travel, public facilities and tourist sites. Vulnerable groups were specifically mentioned as requiring assistance, including the "*underprivileged communities*", the "*homeless*" and those impacted by specific elements of the disaster, such as "*. . .people whose houses were swept away by mud*".

## 4. Discussion

To our knowledge, this is the first study to explore both adult and adolescent disaster survivors' conceptualisations of community resilience. Therefore, these findings contribute novel perspectives on a disaster-affected community's achievement of and desire for a resilient recovery.

As the current study extends the work of Murphy et al. [8], we draw attention to the similarities in our results (see Figure 4). We found that livelihood and economic sufficiency, community participation and cohesion and the desire for relief from negative emotional/psychological experiences (e.g., through psychosocial support) were commonly considered to foster community resilience. However, our findings diverge from those of Murphy et al. [8], as participants in our study also valued intra-personal psychological resources, religiosity, re-establishing a secure home/living arrangement, reconstructing the built environment and developing disaster mitigation advice and awareness (see Figure 4). The themes found by Murphy et al. [8] that were not apparent in the current study are confronting root causes, NGOs working with the local government and communication between the community and NGOs.
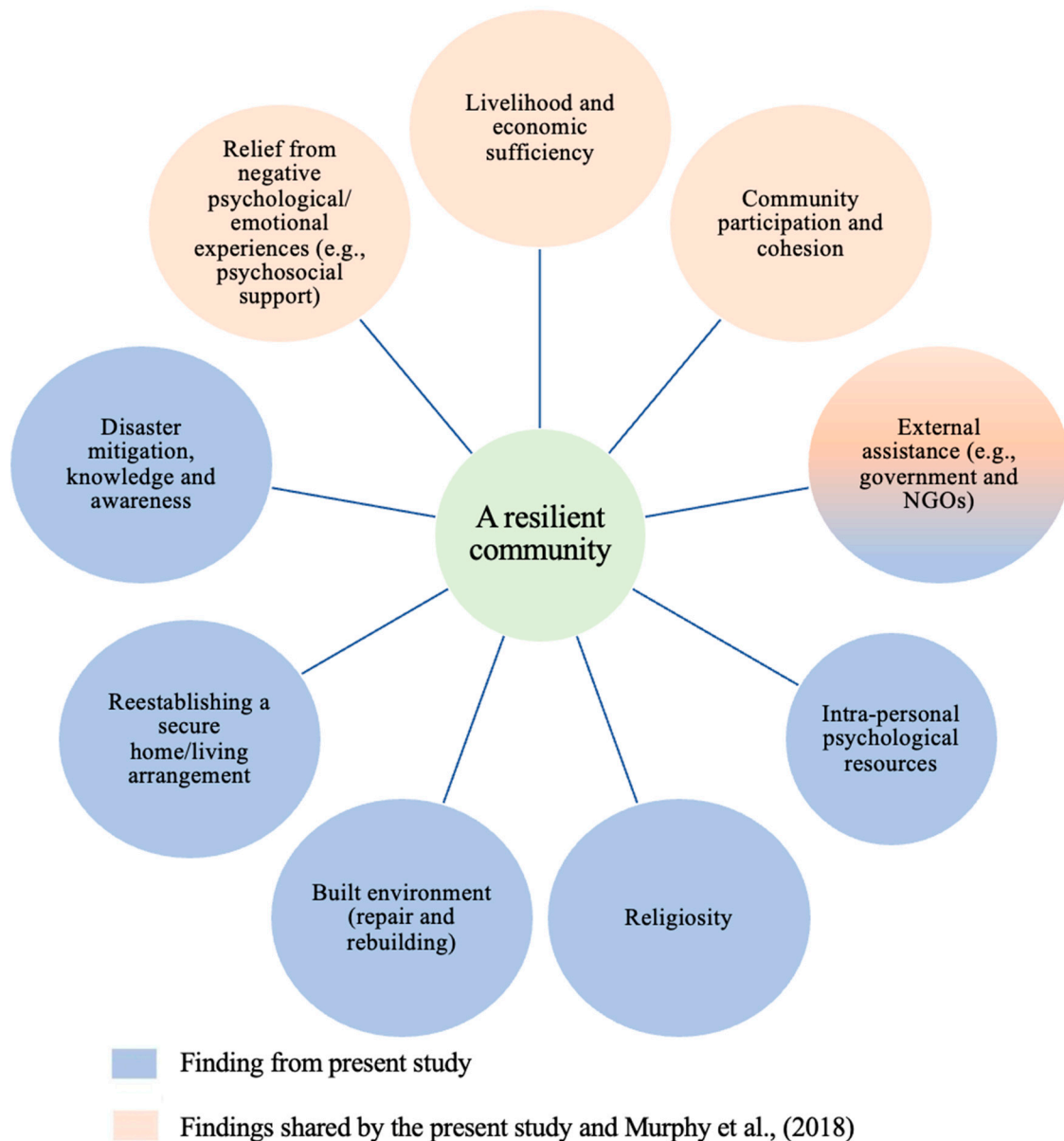
**Figure 4.** Overlap between our findings and the findings of Murphy et al. [8].

Although the participants referred to NGO support in the present study, these responses lacked the specificity of the themes found by Murphy et al. [8]. For example, in the present study, most references to government and NGO assistance featured the support received or the recommendation of additional or more timely assistance. Such discrepancies could be the consequence of features unique to the Palu location (e.g., respect for authorities), temporal differences (i.e., time elapsed since disaster) or sampling differences, as Murphy et al. [8] purposely sampled adult local actors and disaster survivors who had taken part in humanitarian interventions, whereas the present study focused on three groups of education-related stakeholders, including girls. This emphasises the importance of collecting data from a range of participant groups at multiple time points following a disaster to ascertain conceptualisations of resilience.

In particular, this study brings to the fore the importance of listening to the views of young disaster survivors. In our study, young survivors emphasised the value of community participation and cohesion and a desire to repair and rebuild the physical environment and foster their psychological recovery. This included the need to have intra-personal psychological resources and strategies (e.g., a positive mental outlook) and a

collective recovery from negative psychological and emotional experiences. We found that student conceptualisations of and recommendations for a resilient recovery often differed from the views of important adults in their lives, for example, regarding their emphasis on the built environment and prevalent mentions of "trauma healing". The vulnerability of children exposed to natural hazards is well recognised, yet their role in disaster mitigation and recovery has often been overlooked [92]. Increasingly, research and policy experts argue for a child-centred approach to disaster risk reduction and resilience programmes (see [93]). The students offered sophisticated suggestions for building a strong community, such as advocating for simultaneously supporting psychological, infrastructural and economic recovery and referring to specific disaster mitigation techniques. This testifies to the importance of consulting students directly to incorporate their unique needs and priorities when designing post-disaster psychosocial interventions.

In terms of how the survivors coped, their conceptualisations of their community's strengths and their recommendations for a resilient recovery, the following elements must be thought through: the meaning of home for survivors, collective coping strategies and the role played by religion in coping. Regarding recommendations to strengthen community resilience, students were more likely to mention the material environment than adults, such as the local infrastructure and their homes. Beyond the material value of the home as an essential resource, the *symbolic* loss of meaningful places may cause survivors emotional distress (see [94]). Homes are often symbolised as places of safety [95]; when unexpected damage to a home occurs, this can violate feelings of security, routine and trust [96]. While the adults, particularly caregivers, expressed a more general desire to return to pre-disaster normality, the students emphasised their desire for the physical repair of buildings and infrastructure. This is consistent with research that shows that throughout the reconstruction period, environmental damage can leave residents feeling disorientated [97]. Furthermore, unrepaired buildings may serve as everyday reminders of the disaster and can trigger PTSD symptoms [98], which children may be more vulnerable to [18]. This finding implies that the physical reconstruction, rapid removal of debris and repair of homes after a disaster should be prioritised by governments during the recovery period. As students were particularly impacted, priority should be given to the repair and debris removal from familiar spaces for young people, such as schools.

Regarding the participants' reflections on how they had coped with post-disaster stressors, all three groups referred to collective coping strategies in the main. This is consistent with research that found that a range of East Asian countries orientated to cultures of collectivism, including Korea [99] and Indonesia [100], tend to ascribe agency to groups more than to individuals. This finding further reinforces our claim, in the introduction, that individualistic resilience paradigms may not be relevant in non-individualistic cultures. Often, the participants' collective coping style involved actively confronting the stressor, which is considered a mechanism for facilitating resilience [101]. For example, the community came together to promote practical action, such as supporting one another to access necessities including food and drink. Financial coping was also considered a collective activity, as the community worked together to collect donations. Both the adults and students often referred to intra-personal psychological resources/strategies (e.g., the need to be "*strong*") as a collective phenomenon, including the notions of *their city rising* and getting up *together*. Such optimistic outlooks that include an orientation towards the future have been suggested in the existing literature to foster proactive action to future disasters [102]. In the community we studied, collective support is sustained in the post-disaster years; the community is viewed by its members as cohesive 40 months after the disaster. This is consistent with the "community competence" and "social capital" elements of Norris et al.'s [10] model of community resilience.

Furthermore, the emphasis placed on community participation and cohesion by all three groups is consistent with social psychological research that explains altruistic behaviour after disasters through the lens of social identity theory (e.g., Ntontis et al., [56]). This sense of identification occurs when survivors view themselves as sharing a common

fate [103], which is consistent with our findings that participants reflected on solutions to cope with their shared post-disaster challenges. Our findings suggest that such increases in community altruism and coordination are sustained three and a half years post-disaster.

Relatedly, when reflecting on how the survivors coped and their conceptualisations of a strong community, the participants often referred to mutual assistance, "*gotong royong*", which is a traditional Javanese practice that encourages social cohesion and a strong sense of community after a disaster [104,105]. Similar findings regarding "*gotong royong*" are in evidence elsewhere in Indonesian post-disaster contexts. For example, after the 2002 earthquake in Java, survivors worked collectively to participate in the rescue and rebuilding efforts, including retrieving people from the rubble, cleaning debris and distributing necessities [100]. Our findings suggest that the concept is pervasive in Central Sulawesi, and therefore has extended beyond its Javanese roots to elsewhere in Indonesia. Consequently, the cultural concept of "*Gotong Royong*" may have promoted post-disaster collective action, cohesion and solidarity rather than a shared disaster identity (e.g., [52,54]). This also illuminates the importance of being specific in how we approach community in the landscape of promoting resilience. Efforts to promote solidarity and collective action involve action-oriented principles that efforts to promote a shared identity would not automatically trigger, with important implications for support programmes developed in this setting. It would be beneficial to explore, cross-culturally, the interaction between the cultural concept of "*gotong royong*" and survivors' shared post-disaster identity.

Given that religion is considered a central feature of life in Indonesia [106], it is surprising that religiosity was not at the forefront of the participants' responses, particularly for the two adult groups. It is possible that religiosity was not explicitly reflected upon as it is taken for granted as a central feature of daily life. Religious responses occurred most often when the participants were asked directly about how they had coped, which is consistent with the literature that suggests religion is an important dimension of the coping process, allowing individuals to find meaning in times of stress [107]. Generally, the participants' responses portrayed God positively: students referred to trust and sought protection from God, while adults often referred to collective devotional activities, such as communal prayer. Coping through religion is expected to lead to positive outcomes when God is viewed as supportive and benevolent, whereas a representation of God as punitive is more likely to be associated with negative psychological outcomes [108]. For this sample, religion seemed to enhance social support and community cohesion. This is consistent with the findings from disaster contexts elsewhere in Indonesia, where religious practices enhance psychological coping post-disaster and motivate altruism [105].

A key implication of this study is that participants' recommendations can be used to inform community resilience-building interventions. A clear priority for the community is to build livelihood and economic resilience, most notably amongst caregivers. While this may seem beyond the capacity of psychosocial interventions, there is growing evidence of the effectiveness of interventions that target social determinants to produce positive mental health outcomes [82]. For example, interventions can empower those who have experienced social adversity to tackle poverty through improved budgeting and identifying income-generating opportunities [109]. As community members are facilitated to address the problems that are the most salient for them, this can enhance their well-being. Furthermore, this resonates with supporting the "economic development" capacity featured in Norris et al.'s [10] model of community resilience.

As the above studies show, maintaining a focus on the social determinants of mental health is important, but it may still benefit from being combined with localised trauma-focused psychological support. Although students were more likely to mention coping via strategies and support to relieve negative emotional experiences than adults, emotions such as trauma and fear were particularly salient in the caregivers' conceptualisations of a *strong community*, indicating that trauma symptoms are on-going for over three years post-disaster. Similarly, some teachers' responses implied that there remains a need for psychological

support for the community. This is consistent with the literature that demonstrates elevated PTSD symptoms up to between 5 years [18,110] and 10 years post-disaster [111,112].

For psychological healing, community members tended to reflect on the benefits of social support. However, students were more likely than adults, particularly caregivers, to mention professional forms of psychological support received. This may be due to students being more familiar with the support provided by NGO initiatives (see [113]), which may expose students to Western psychological terms, such as "trauma healing". Supporting this, occasional references to "trauma healing" were also made by teachers. Outside of the school environment, however, there is likely to be low exposure and access to professional psychological support for caregivers [114,115]. Alternatively, it is possible that psychological support was more frequently sought by young people as they face a greater burden of mental health concerns (e.g., [18]). Other potential explanations include generational differences regarding issues of stigma among adults (e.g., see [116]), or that adults view social determinants (e.g., unemployment) as the causes of mental health concerns.

Psychological support does, however, remain highly valued. Murphy et al. [8] found that when psychological support was received, survivors found this to be the most highly appreciated component of the disaster response in the Banda Aceh region of Indonesia. Furthermore, adults were likely to recommend that the community demonstrate intrapersonal psychological resources and strategies, such as the need to rise up, adopt a positive mentality and be strong. Strategies to do so may be developed via psychosocial interventions. Therefore, resilience-building interventions would benefit from offering a combination of support that aims to address both the social determinants of mental health and forms of professional psychological support.

A further intervention implication is that survivors, especially teachers, desire to improve disaster mitigation knowledge and practice. Increasing disaster preparedness is one way to reduce human vulnerability to future seismic hazards (e.g., by securing heavy items, having insurance and an evacuation plan and storing emergency supplies). As well as physically safeguarding the community, enhancing disaster risk reduction knowledge may benefit collective efficacy, which is a key component of psychosocial post-disaster recovery [117]. However, the literature testifies to a cross-cultural lack of preparedness, even amongst communities that have a high awareness of disaster risk [83]. Therefore, increasing residents' knowledge of mitigation techniques is insufficient to lead to sustained disaster-related behaviour [118,119].

In the design of an appropriate intervention, non-individualistic factors (e.g., collective efficacy, a sense of community and trust) should be considered, as these have been posited to be particularly important for promoting preparedness in collectivistic cultures [120]. Forming disaster mitigation groups, as suggested by participants in this study, may also provide a mechanism to enhance the processes of both "community competence" and "information and communication" aspects of Norris et al.'s [10] model of community resilience.

The present study also has methodological implications, as we adapted the interview method used by Murphy et al. [8] to open-ended survey questions. This method enables a vast amount of rich data to be generated on the different facets of community resilience without being overly burdensome for participants and researchers (i.e., compared to the time taken for interview methods).

## 5. Limitations

The findings of this study must be considered in the context of some limitations. The different questions asked of adults and students may account for some of the differences between the two groups' responses. For example, to gain insight into the participants' conceptualisations of a resilient community, the adults were asked "what would a strong community here in Palu look like after disaster?", whereas the students were asked a creative but less abstract question that is grounded in their lived experiences: "As Mayor, what do you think your community has done well since the disaster?" However, there were evident similarities between the groups, which may reflect that some adults' responses

referred to their experience of current community strengths rather than what a hypothetical strong community *would* look like. For example, some adults said that the community is becoming stronger by working together.

Furthermore, the data may be influenced by order effects, as participants may be unlikely to mention the same category of content in response to multiple questions. The participants' desire to avoid repetition may explain some of the discrepancies in the prevalence of codes among the same groups depending on the question domain. For example, the students mentioned intra-personal psychological resources often in response to the first question regarding how the community has coped, but mentioned it infrequently in the response to the second question regarding what their community had done well since the disaster.

The systematic emphasis on frequency counting in the content analysis method may result in the exclusion of responses that are salient to participants but difficult to articulate. For example, one participant stated the recommendation of "*no more Nomoni Palu Festivals*". This refers to an event that took place on Palu beach the day of the disaster. Although this response did not fit into any of the coding categories devised, anecdotal discussions with Indonesian researchers suggested that myths around the festival are pervasive. However, based on the current data, it is difficult to know whether rare mentions are idiosyncratic or are an important, but hard to articulate, feature of participants' coping methods. Furthermore, facets of the community's recovery that are taken for granted may have been infrequently mentioned, such as family support and religiosity. Additionally, some responses, particularly from the students, contained only a few words that were ambiguous to interpret and could not be probed further. Therefore, while open-ended survey questions enable a large amount of rich data to be generated and analysed, the breadth of the data may compromise depth when compared to the content elicited by interview methods. However, the method is also useful for feasibility studies, as it can act as a starting point for a quantitative or mixed-methods study, by facilitating the selection and/or development of valid psychometric scales.

## 6. Conclusions

In conclusion, the current exploratory study sought to explore local survivors' conceptualisations of community resilience after a major disaster. In doing so, this work generated novel insights regarding survivors' subjective views of what constitutes community resilience: intra-personal psychological resources and strategies, community participation and cohesion, livelihood and economic sufficiency, relief from and support for negative psychological/emotional experiences, disaster mitigation knowledge and awareness, religiosity, reconstruction of the built environment and external assistance (e.g., governmental and NGOs). By enhancing our understanding of how a community has coped with the disaster, how they conceptualise a strong community and their recommendations for a resilient recovery, this study forms the first step in designing a local-perspective-informed intervention to empower communities who are often excluded from discussions of their own resilient recovery and marginalised from disaster-related decision making. Overall, these findings shed new light on the processes of adaptation and the differing priorities of young people and adults after disasters, with important implications for future psychosocial intervention design.

## Appendix A

**Coding Frame**

| Coding category | Content | Example |
|---|---|---|
| The home/living arrangement | Evacuation of home, damage/rebuilding of home, moving location, living in temporary accommodation, change in relationship with home, any mention of home of self or others | "The houses on the coast were rebuilt for the people whose houses were hit by the tsunami". |
| Livelihood and economic | Unstable economy, lack of finance (micro and macro scale), employment loss or change, mention of businesses | "Doing activities like making chips for business" |
| Community participation and cohesion | Wider community togetherness, helping and altruism to those less fortunate, supporting, feeling closer to one another, practical action of mutual help ("gotong royong") | "Help and support each other" |
| Family support | Family support, any mention of family members | "By going on vacation with family" |
| Built environment | Repair and improvement or on-going damage of the physical built environment, including infrastructure (i.e., roads, buildings, the city) | "Rebuilding the 4 Palu bridge so that the Palu community can transport wherever they can and don't have to go around looking for a way". |
| External assistance (e.g., government or NGO) | Assistance external to the community of place. Mention of government (including provincial bureaucracy) or NGOs including both positive and negative support (i.e., including lack of support, unequal support or desired support), specific support schemes (i.e., to rebuild homes), government training (e.g., in disaster mitigation). Mention of aid provisions | "In the early days after the incident, the community was very dependent on assistance from the government and NGOs that helped…" |
| Religiosity | Gratitude to God, attribution to God, individual prayer/religious activities, communal religious activities, relationship to God, importance of mosques | "Dhikr [collective form of prayer] with the people of Loru village in mosques" |
| Relief from negative psychological/emotional experiences | Experiencing negative emotions including trauma, fear and anxiety; relieving trauma, fear and anxiety; professional support such as trauma healing and activities that relieve psychological distress and negative emotions | "There are people who hold trauma healing/events that function to relieve trauma for people affected by disasters". |

| Coding Frame | | |
| --- | --- | --- |
| **Coding category** | **Content** | **Example** |
| Intra-personal psychological resources/strategies | Hardiness, strength of the people or individual, rising up, being enthusiastic, overcoming challenges, adopting a positive attitude/mental outlook, individual strategies to manage psychological responses (e.g., self-regulation to stay calm)Intra-personal strategies to control emotions | "Stay strong because you have experienced yesterday's disaster so your strength is maintained…" |
| Loss of life | Mention of death or loss of individuals or community members, reference to the disaster claiming lives or victims | "Some recover quickly and some don't. For example, the people of Tito have experienced a lot of trauma, especially when they witnessed the death of their own family or relatives" |
| Basic needs and necessities | Food, water, clothing, anything deemed essential Cleanliness/hygiene | "gotong royong [mutual help] to find necessities such as food, drink and evacuation equipment…" |
| Return to normality | Normal life resuming including reopening of services, returning to pre-disaster experience, carrying out activities as usual | "Returning their pre-earthquake roles in their respective activities" |
| Disaster mitigation, knowledge and awareness | Being more alert/careful, more knowledgeable or taking precautions against disaster, specific strategies of disaster mitigation such as tree planting | "Knowing about disaster mitigation" |

Note: Coding categories are not mutually exclusive, and responses may be assigned more than one category when the response clearly belongs to both. For example, the response "We are trying to lighten the burden on our fellow community members by carrying out social and religious actions" would be coded as both "community participation and cohesion" and "religiosity".

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