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Understanding the Complexity of Healthcare Staff Responses to Collective Personal and Occupational Stress Using the Adversity-Activated Development Reflection Tool

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Abstract

The adversity-activated development reflection tool (AART) has been used therapeutically to capture personal growth arising during adversity. Our mixed-methods study used this tool to assess adversity-activated growth in 854 mental and community healthcare workers during the COVID-19 pandemic. Participants used the tool to describe the positive and negative effects of the COVID-19 pandemic in different life domains (self, family, work, and community). Through an ideal-type analysis of 133 purposively subsampled AARTs, we derived three levels of adversity-activated development (AAD): none, minimal, and deep. Higher levels of AAD were associated with spending more time connecting with friends and family (OR = 1.83, 95% CI 1.23 to 2.75, $p < 0.01$) and skill development in mental health care (OR = 1.63, 95% CI 1.16 to 2.28, $p < 0.01$). Deep development was characterised by changes in life priorities, changes in coping, realising strengths and capabilities, and making stronger connections with others. The AART can usefully assess both positive and negative growth, enabling respondents to convey the complexities of their experiences in their own words, whilst allowing the levels of overall self-development to be distilled. Our findings reinforce the value of promoting social connectedness and skill development to facilitate employee growth during collective occupational stress.

Keywords: post-traumatic growth; development; health workers; adversity; pandemic



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1. Introduction

The COVID-19 pandemic posed unprecedented threats to people and resulted in the catastrophic worldwide death of nearly seven million, inflicting incalculable losses and suffering [1]. Every aspect of people's lives was affected: living conditions, educational opportunities, financial status, physical and mental health, and human relations [2,3]. Healthcare professionals encountered double-layered adversity through their additional exposure to enhanced risks and the burden of their caring responsibilities [4,5]. These challenges may be considered a psychological contract breach, whereby health workers' expectations of what their employer expects of them, and of what obligations their employer has towards them, are transgressed, and a breakdown of trust in one's employer can

result [6,7]. The unrelenting uncertainty, uncomfortable unfamiliarity, vulnerable helplessness, and life-threatening nature of the COVID-19 pandemic can be considered a “Severe Form of Collective Adversity” (SFCA) [8]. Healthcare organisations have a responsibility to protect their staff from burnout and stress and enable them to achieve personal growth in times of adversity [9]. Understanding the complexity of responses towards collective adversity and stress, both on personal and societal levels, can pave the path for interventions that foster resilience, coping, and creative solution-focussed approaches. Post-traumatic growth (PTG) refers to positive psychological change experienced as a result of the struggle with highly challenging life circumstances [10]. Similarly, investigating the complexity of responses to adversity—initially in the context of refugees from war—Papadopoulos identified a range of changes that included not only traumatisation but also new strengths acquired directly from exposure to adversity, termed “Adversity-Activated Development (AAD)” [11]. A central aspect of the AAD construct is that growth can occur following a wide gamut of adverse experiences beyond a narrowly defined trauma construct. Whilst Calhoun and Tedeschi also acknowledge this in their later writings on PTG [10], the AAD construct more explicitly and clearly unlinks growth from trauma. AAD also unites within a single construct the idea that PTG can occur alongside negative changes, in that positive growth is seen as sitting along with a flexible appreciation of the negative effects of adversity upon the self. In addition, AAD differentiates between retained strengths from before the adversity and new strengths that were specifically activated by the adversity [8,11,12].

Typically, post-traumatic growth is assessed using self-report scales such as the Post-Traumatic Growth Inventory (PTGI) [13,14]. These allow a systematic assessment of the variance in growth experiences across large samples, but do not enable an understanding of how growth experiences have arisen or how they interrelate with any negative changes. By contrast, Papadopoulos’ ‘Adversity-Activated Reflection Tool’ (previously also referred to as ‘Adversity Grid’ [8] (pp. 268–284)) can be used clinically to explore the range of both positive and negative responses to adversity in individuals but also in families, in organisations, and in communities. The Tool consists of a grid to prompt individuals to reflect on the personal effects (negative, unchanged, and positive) of adversity in four spheres: on them as individuals, on their family, on their work place, and on their wider community/society. The AAD construct and grid have previously been used as a framework for the analysis of in-depth qualitative interviews with refugees and disaster survivors [15–17], providing a rich and complex understanding of growth experiences following adversity. However, the AAD grid has not previously been used as a data collection tool, nor for a larger-scale systematic assessment of the levels and types of growth experiences alongside negative changes. We aimed to test the feasibility and utility of using the AART to systematically assess positive and negative growth experiences in healthcare workers’ response to the pandemic as an exemplar of extreme collective personal occupational and occupational stress. We further aimed to explore what healthcare workers’ responses to the tool can tell us about their experiences of adversity-activated development. The present research drew on mixed-methods cross-sectional data from the first round of a wider prospective cohort study on the impact of the COVID-19 pandemic on mental and community healthcare workers, at the height of the pandemic [18]. Using the ‘Adversity-Activated Reflection Tool’ to assess AAD (based on the ‘Adversity Grid’ [8,11]), we aimed to answer the following questions:

1. To what extent did staff engage with the AART and how was AART completion and perceived usefulness associated with staff’s professional and demographic characteristics?
2. How did staff use the sections of the tool to describe positive and negative pandemic effects across different life domains?
3. What levels and types of positive adversity-activated development did staff describe?
4. We further aimed to test hypotheses about correlates of adversity-activated development.

- (i) We hypothesised that greater AAD as derived from the AART would be associated with higher levels of post-traumatic growth as measured by the PTGI, since they assess overlapping constructs.
- (ii) AAD is theorised to be promoted by psychological and social structures that facilitate complex and reflective processing of adversity and that reduce reactive simplistic psychological reactions [8,11,12,15–17]. Such structures may relate to social support, community, and reflective systems of thinking including spirituality [8,11,12,15–17]. Relatedly, we hypothesised that, as in previous research, and as in our evaluation of predictors of PTGI scores in the same sample [18], the following groups of staff would show higher levels of adversity-activated development: women [18,19], black and ethnic minority staff [18–20], staff with greater pandemic-related anxiety [18,19], staff engaging more in reflective activities [18,21,22], staff connecting more with friends, family, and colleagues [18,19,23,24], staff feeling more supported by senior management and by the people of the UK [18,25,26], and staff developing more skills in physical and/or mental healthcare [18,27,28]. These potential correlates link to theoretical understandings of growth as promoted by self-reflection and emotion-focussed coping (more characteristic of women), meaning-making through spirituality (more characteristic of UK ethnic minorities), perceived social support, and perceived growth in competency [29–32]. Further, our hypothesis that greater pandemic-related anxiety will be correlated with greater development relates to the idea that experiencing stress and the reflective processing of these stressful experiences may be a necessary precursor of post-traumatic growth [33,34].

2. Methods

2.1. Design

This was a mixed-methods study of the feasibility and output of the adversity-activated reflection tool (AART), and predictors of adversity-activated development, amongst mental and community healthcare workers at the height of the COVID-19 pandemic. We undertook a quantitative analysis of the use of the AART tool and predictors of its uptake and contents. In a subsample, we used ideal-type analysis to explore the levels of positive adversity-activated development described within the tool, predictors of adversity-activated development, and thematic analysis to understand the types of positive and negative adversity-activated development described. Critical realist ontology informed an understanding of how participants' accounts were shaped by wider social determinants [35].

2.2. Participants

The study was conducted across four National Health Service (NHS) Trusts in England with diverse characteristics (specialising in mental health care or both mental health and community care, located in semi-rural or in urban inner London localities). Any member of staff working in any role in one of the participating Trusts was eligible to participate. Both clinical and non-clinical staff were included. Data was collected between 16 July 2020 and 30 September 2020. This spans a time in which COVID-19 cases were initially falling and some restrictions were being lifted across the country, although the Government was still recommending people avoid gatherings larger than six, followed by a subsequent resurgence of COVID-19 rates and a renewed tightening of restrictions [36,37].

2.3. Procedure

Research and Development personnel in participating NHS Trusts sent invitations to participate in the survey to all staff in their Trusts, via targeted emails and staff news bulletins, between 16 July 2020 and 30 September 2020. Interested staff were provided with a link to view the participant information sheet, hosted on Qualtrics survey software (Provo, UT, version accessed between 16 July 2020 and 30 September 2020, <https://www.qualtrics.com/use-cases/surveys/> (accessed on 29 January 2026)) to decide whether to participate. Interested staff then completed the consent form and survey online, using Qualtrics.

2.4. Measures

- Demographic and professional characteristics (gender identity, age, ethnicity, British citizenship, healthcare sector, work location, profession, and NHS Trusts) were collected using a standardised pro forma developed by the research team.
- Adversity-activated development was assessed qualitatively using the Adversity-Activated Reflection Tool/AART (based on 'Adversity Grid' [11,12]). This tool was originally designed to be used therapeutically and completed with the support of a therapist. To adapt it for online self-completion, participants were given instructions on how to complete it, in line with the guidance usually offered by a therapist (Supplementary Materials Box S1). Using open text boxes in a grid system, staff were asked to write about the personal effects (negative change and positive change) of the pandemic in four spheres: on them as an individual, on their family, on their work (their own work, their team, and the wider organisation), and on their wider community. This was the final section of the survey and was not compulsory to complete.
- To assess concurrent validity of the AART findings, post-traumatic growth was measured using the 10 item Post-Traumatic Growth Inventory (PTGI)—Short Version, which has demonstrated construct and convergent validity [13] (our sample $\alpha = 0.91$). Scores range from 0 to 50, with higher scores indicating greater growth.
- Personal, environmental, and organisational protective factors were derived from available academic literature and selected from factors shown to independently predict post-traumatic growth in the wider sample [18]. These were collected using a standardised pro forma developed by the research team. They included the following single-item measures rated on a 4-point Likert scale from "Not at all" (0) to "A lot" (4), each prefaced with "Since the COVID-19 pandemic began, to what extent have you done the following:": "Spent time connecting with friends and family"; "Spent time connecting with colleagues"; "Spent time on positive self-reflection e.g., mindfulness, meditation, self-help"; "Felt supported by senior management", "Felt supported by the people of the UK", "Developed new knowledge or skills in delivering mental health care"; and "Developed new knowledge or skills in delivering physical health care". Scores on each single-item measure range from 0 to 4, with higher scores indicating greater endorsement of the item.
- A measure of personal and occupational stress relating to the COVID-19 pandemic was derived from mean scores on the following items, rated on a Likert scale from "Not at all" (1), "A little bit" (2), "Somewhat" (3) to "A lot" (4): "Worry about yourself or loved ones becoming seriously ill or dying from COVID-19"; "Worry about colleagues becoming seriously ill or dying from COVID-19"; "Worry about service-users becoming seriously ill or dying from COVID-19"; "Worry about your service-users becoming seriously ill or dying from other serious mental or physical health conditions"; "Feeling less able to deliver adequate and safe mental health care"; and "Feeling less able to deliver adequate and safe physical health care" ($\alpha = 0.78$).

2.5. Sub-Sample for Qualitative Analysis

A subsample of 100 cases was selected for in-depth qualitative analysis, using purposive sampling to ensure staff with a range of different characteristics, such as gender identity, ethnicity, and profession, were included. To gain an in-depth understanding of the experiences of staff describing different levels of adversity-activated development during the pandemic, we aimed to sample at least 25 cases of each typology of adversity-activated development. As a first step, we randomly selected 30 AART grids from the full sample for in-depth analysis, by entering the participant ID numbers into the GIGA Calculator Random Name Picker [38]. The team identified that males and people from ethnic minorities were under-represented. A further random selection of 30 cases was then made from all male participants and from all black and minority ethnic participants, aiming for at least 15 further male cases, and at least 15 further black and minority ethnic cases. We then randomly selected further cases from the full sample, continuing to sample until we reached our quota for each development type. This resulted in a final sample of 133 AART grids.

2.6. Data Analysis

2.6.1. AART Completion

We descriptively analysed the frequency and co-occurrence of negative and positive developments in each of the studied domains (self, family, work, and community). For each domain, empty cells or responses of “none” or synonyms were classed as not reporting developments in that area. Participants who had not filled in any AART cells were excluded from analysis. We used logistic regression to test staff sociodemographic and clinical characteristics as predictors of AART non-completion, Poisson regression to test associations with the number of words written, and ordinal logistic regression to test associations with perceived helpfulness of the AART.

2.6.2. Developing Levels of Positive Self-Development

We used ideal-type analysis [39] to develop typologies of adversity-activated development as captured by the AART. We chose this as the most appropriate method of developing typologies as this is the purpose of this type of analysis. A team-based approach was used throughout, with analysis led by RB and AC, and reviewed and refined by KB. Case reconstruction summaries were made for each of the 133 selected AART grids, which summarised positive changes the person described in themselves, alongside any positive changes described in other spheres of their lives (work, family, and community) and any negative changes described. Each case summary in the dataset was then systematically compared to the others to form clusters or groupings of similar cases, i.e., typologies. Based on these, the research team agreed that the cases could be classified into “deep”, “minor”, and “no” positive self-development. “Deep” development was defined as a profound shift in a person’s thinking, beliefs, attitudes, and/or behaviour—for example, gaining new insights about themselves or other people or the world, making major life decisions, and making major lifestyle changes. “Minor” development referred to more superficial changes in attitude and/or lifestyle. No development was coded when a participant reported no positive changes in themselves, either by stating “none” or a synonym in response to the question about positive changes in themselves, or by giving an answer that referred to stasis rather than change, or referred to positive developments in other areas of their lives but not in themselves. Exemplar quotes for the three categories are given in Supplementary Materials Table S1. Seven cases were independently rated by co-author RP, the developer of the AART, and 100% rating agreement was established. Then, 30 further cases were reviewed by RP to ascertain that the classifications fitted with its theoretical con-

ceptualisation. This team consensus process aimed to enhance the credibility of the coding by taking into account multiple possible interpretations of the data, thus avoiding undue influence by any one person's perspective [40]. We then used ordinal logistic regression to analyse the association between AAD level, demographics, the measured protective factors, and PTGI score.

2.6.3. Types of Deep Development

We used in-depth thematic analysis [41] to better understand the nature of the adversity-activated development experienced by staff categorised as undergoing deep development. The 26 cases classified as deep development were imported into NVivo software (version 13), and coded line by line. Coding was organised deductively under the AART domains. The codes under positive effects on self were then categorised into themes and sub-themes by RB and KB to generate a rich understanding of the nature of adversity-activated development experienced. Finally, narrative summaries of their experiences of four deductively derived types of negative pandemic effects were constructed.

2.7. Reflexivity

All analysts had, themselves, experienced pandemic-related adversity, with two having done so as mental health professionals, in common with many of our participants. The analysts engaged in reflexive discussion with each other about the impact of their own experiences on their interpretation of the analysis, recognising that their interpretations of the data will inevitably have been shaped by personal experiences.

3. Results

3.1. Sample Characteristics

For our study, 854 staff took part, from a total potential sample of 24,800 staff members across participating NHS Trusts (data provided by Trust Research and Development departments). The sample was representative of the wider UK workforce in several ways. For instance, the proportion of black and minority ethnic staff in the sample (24%) is representative of that within the wider UK NHS workforce (22%) and within the participating Trusts, as is our proportion of male staff participants (23% in the wider UK NHS workforce). Detailed characteristics are presented in Table 1 below.

Table 1. Sample characteristics.

Participant Characteristics	N (%) or Mean (sd)
Gender identity	
Male	150 (17.6%)
Female	695 (81.4%)
Other	6 (0.7%)
Missing	3 (0.3%)
Ethnicity	
Asian—Bangladeshi, Indian, Pakistani	35 (4.1%)
Asian—Chinese or Other	8 (1.0%)
Black—African, Caribbean, or Other	35 (4.1%)
Mixed	30 (3.5%)
White—British, Irish, or Other	732 (85.7%)
Other	11 (1.3%)
Missing	3 (0.3%)
Age (years)	47.6 (11.24)

Table 1. Cont.

Participant Characteristics	N (%) or Mean (sd)
Workforce sector	
Community physical health	64 (7.5%)
Mental health	722 (84.5%)
Primary care	33 (3.9%)
Missing	35 (4.1%)
Work location	
Administration offices	208 (24.4%)
Community	435 (50.9%)
Community and inpatient	93 (10.9%)
Inpatient	116 (13.6%)
Missing	2 (0.2%)
Profession	
Administration	147 (17.2%)
Allied health professional	109 (12.8%)
Consultant medic	33 (3.9%)
Healthcare assistant	48 (5.6%)
Management (non-clinical)	55 (6.4%)
Nursing/midwifery	212 (24.8%)
Psychologist/psychotherapist	154 (18.0%)
Scientific & technical	4 (0.5%)
Social worker	27 (3.2%)
Trainee doctor	6 (0.7%)
Other	59 (6.9%)

3.2. Staff Completion of the AART

In total, 759 participants completed at least one cell of the AART (89% of the 854 staff taking part in the wider study). There was no association between completion of the AART and participant gender identity (OR males vs. females = 0.67, 95% CI 0.40 to 1.12, $p = 0.130$), or ethnicity (OR black and minority vs. white ethnicity = 0.62, 95% CI 0.35 to 1.09, $p = 0.100$). Taking administrative staff as the comparator, psychology/psychotherapy staff were more likely to complete at least one cell of the AART (OR = 3.64, 95% CI 1.46 to 9.09, $p = 0.006$). For participants who completed at least one cell, the number of words written to describe positive self-developments ranged from 0 to 144 ($M = 14.83$, $sd = 18.69$). On average, participants wrote most about negative work developments (range 0 to 359, $M = 23.23$, $sd = 34.37$) and least about positive family developments (range 0 to 138, $M = 9.20$, $sd = 13.59$). Taking positive self-development as an exemplar, males wrote fewer words than females (IRR = 0.65, 95% CI 0.62 to 0.70, $p < 0.001$), black and minority participants wrote fewer words than white participants (IRR = 0.75, 95% CI 0.71 to 0.80, $p < 0.001$), and all professional groups wrote more than administrative staff (Supplementary Materials Table S2). Overall, 83% described some negative self-development, 83% described positive self-development, 93% described negative changes for their family, 69% described positive changes for their family, 93% described negative changes at work, 84% described positive changes at work, 79% described negative changes in their community, and 74% described positive changes in their community. By far the most common pattern was to describe both positive and negative changes in each measured domain of life (see Table 2). The next most common pattern was to describe no positive changes combined with negative changes, which was particularly prevalent in the family domain (26% of participants).

Table 2. Intersection between positive and negative developments (n = 759 with data).

	Self		Family		
	Yes positive	No positive	Yes positive	No positive	
Yes negative	626 (83%)	83 (11%)	Yes negative	508 (67%)	197 (26%)
No negative	29 (4%)	21 (2%)	No negative	17 (2%)	37 (5%)
	Work		Community		
	Yes positive	No positive	Yes positive	No positive	
Yes negative	604 (80%)	102 (13%)	Yes negative	489 (64%)	108 (14%)
No negative	33 (4%)	20 (3%)	No negative	71 (10%)	91 (12%)

3.3. Levels of Positive Self-Development

Based on an ideal-type analysis of 133 cases, three levels of development were derived: deep development (n = 26), minor development (n = 76), and no development (n = 31). The gender identity, ethnicity, and professions of the 133 cases analysed are shown in Table 3, alongside their mean scores on the PTGI measure and their mean ratings of potential protective factors. Twenty-six percent of the 100 cases were male, who had been purposively sampled to be over-represented relative to their proportion in the main sample (18%). Twenty-three percent of the sample were black and minority ethnic staff, who were also purposively sampled to roughly match their proportion in the main sample (27%). A large variety of different professions were sampled.

Table 3. Association between demographic, professional, and growth characteristics and AART development level.

AART Development Level	None (n = 31) n (%) / M (sd)	Minor (n = 76) n (%) / M (sd)	Deep (n = 26) n (%) / M (sd)	OR (95% CI)	p
Gender identity					
Female	15 (48.4%)	62 (81.6%)	22 (84.6%)		
Male	15 (48.4%)	13 (17.1%)	4 (15.4%)	0.26 (0.11 to 0.59)	<0.01
Other	1 (3.2%)	1 (1.3%)	0 (0%)	0.18 (0.01 to 2.63)	0.21
Ethnicity					
White	17 (54.8%)	67 (88.0%)	23 (88.0%)	0.21 (0.08 to 0.51)	<0.01
Black and minority ethnic	14 (45.2%)	9 (12.0%)	3 (12.0%)		
PTGI score	17.9 (13.6)	19.4 (11.0)	26.5 (9.7)	1.04 (1.01 to 1.07)	<0.01
Time spent in reflective activities	2.0 (0.9)	2.3 (1.0)	2.5 (1.1)	1.33 (0.95 to 1.85)	0.10
AART Development level	None (n = 31) n (%) / M(sd)	Minor (n = 76) n (%) / M(sd)	Deep (n = 26) n (%) / M(sd)	OR (95% CI)	p
Time spent connecting with friends and family	2.4 (0.8)	2.9 (0.8)	3.1 (0.9)	1.83 (1.23 to 2.75)	<0.01
Time spent connecting with colleagues	2.5 (0.7)	2.6 (0.8)	2.8 (0.8)	1.44 (0.96 to 2.16)	0.08
Feeling supported by senior management	2.5(1.1)	3.0(0.8)	2.8(1.2)	1.30 (0.90 to 1.90)	0.17
Feeling supported by the people of the UK	2.3(0.9)	2.5 (0.8)	2.4(0.9)	1.07 (0.72 to 1.60)	0.74

Table 3. Cont.

AART Development Level	None (n = 31) n (%) / M (sd)	Minor (n = 76) n (%) / M (sd)	Deep (n = 26) n (%) / M (sd)	OR (95% CI)	p
Extent of anxiety about the personal and work-related consequences of COVID-19	2.7 (0.7)	2.6(0.6)	2.7(0.6)	0.90 (0.54 to 1.52)	0.70
Developing new skills in physical healthcare	1.6 (0.8)	1.8 (0.9)	2.0 (1.1)	1.28 (0.90 to 1.80)	0.17
Developing new skills in mental healthcare	1.9 (0.9)	2.3 (1.0)	2.7 (1.1)	1.63 (1.16 to 2.28)	<0.01

As shown in Table 3, the accounts of male staff and those of black and minority ethnic staff were significantly less likely to be rated as showing deep development than those of female or white staff, respectively. Post-traumatic growth scores on the PTGI, increased time spent connecting with family and friends, and new skills gained in mental health care were significantly associated with a higher likelihood of deep development.

3.4. Types of Deep Positive Development

The accounts of deep positive self-development were thematically analysed, and four types of deep development were derived: “Changing my priorities in life”, “Changing how I cope with life”, “Realising my own strengths and capabilities”, and “Making stronger connections with other people”.

3.4.1. Deep Development Type 1: Changing My Priorities in Life

In total, 14 of 26 participants with deep development (DD) described how the opportunities for reflection afforded by the pandemic had enabled them to gain greater clarity on their values, priorities, and choices in life. These accounts were characterised as reflecting deep development because participants described a shift in their previous ways of thinking.

Reflecting on What Matters to Me

Four DD participants explained how the pandemic had enabled them to reflect on what really mattered to them, and, equally, what did not. The enforced restrictions on their life and changes in their lifestyle, as well as the increased time they had for themselves, meant that they were better able to see what was truly important to them.

“I had more space in my mind to reflect and think about what mattered to me.”
(Participant 11819).

“It’s also made me reflect on how I really want to spend my time and who I want to spend it with.” (Participant 8340).

A Greater Appreciation of the Basics in Life

For five DD participants, the opportunity to reflect on their lives led them to a greater appreciation for what they previously did not fully value—time with loved ones, the ability to go on walks and travel, and the value of health and life.

“Feeling so privileged to have a house, a job, a partner and family, a garden.”
(Participant 2214).

“I’ve realised how important family is and now visit a lot more frequently.”
(Participant 20451).

Making Big Life Decisions

For five DD participants, the increased time to reflect on their priorities and values led them to make big decisions about their futures, including changing their career and deciding who would look after their children in the event of their death.

“I’ve decided to enrol in Doctors without Borders.” (Participant 4821).

“I realised we had to accept that as a front line nurse I might not survive. This meant a difficult discussion which I had been avoiding with my husband (i.e., if we both die who should have our kids) actually became very easy.” (Participant 4614).

3.4.2. Deep Development Type 2: Changing How I Cope with Life

Thirteen DD participants spoke about how the pandemic had enabled them to make positive changes in the way they managed stress and/or their physical health. These changes were portrayed by participants as major shifts in their mental attitude, lifestyle, and/or behaviour, leading to noticeable reductions in stress or improvements in physical health.

Taking Steps to Manage Stress Better

Thirteen DD participants spoke about how the pandemic had prompted them to take steps to better manage their stress. In line with Theme 1, these changes were partly prompted by reflecting on their values and priorities in life, and were also enabled by having more time to devote to self-care (i.e., appreciating nature more, exercising, getting enough sleep, engaging in meditation and spirituality, and taking up new hobbies).

“More spiritual practice. Sleeping better hours. Going to bed earlier. Getting up earlier. Learned value of going for walks around the block.” (Participant 38714).

“Increase in spirituality, and also combined with self-reflection. I have been trying to learn new things like cooking, knitting, embroidery work/sewing, card making, and now I have made a craft diy Instagram page to share my work and hopefully show people they can make these things too.” (Participant 1122).

Others spoke more about taking steps to change the way they reacted to stress, by developing greater resilience to daily hassles, being firmer in setting boundaries with other people, or placing fewer expectations on themselves to do everything perfectly.

“I have always struggled with feeling I must fulfil my responsibilities, and feeling worried that something might get in the way, e.g., me or my kids being sick. Now I feel the whole world understands that things get disrupted sometimes, and it can’t be helped.” (Participant 9658).

Taking Steps to Improve My Physical Health

Four DD participants spoke specifically about how the pandemic had prompted them to make major improvements in their physical health, including a healthier diet, and exercising more.

“Started cycling to work—would definitely not have done this if it had not been for need to avoid public transport. Feel lots of benefits for doing this—physical health especially.” (Participant 39673).

3.4.3. Deep Development Type 3: Realising My Own Strengths and Capabilities

Ten DD participants spoke about how their experiences during the pandemic had helped them to develop a greater awareness of their own strengths and to become more

self-reliant. For some, they were able to embrace the pandemic as an opportunity for growth and innovation and to enact positive changes. These changes were characterised as deep development because they were portrayed by participants as major shifts in the way they thought about themselves.

“Developed some resilience. Learned more about myself. Learned I can manage better than I thought not spending time with others.” (Participant 38714).

“I have discovered a greater inner strength and self-confidence.” (Participant 9730).

“Flexibility, thinking outside traditional and historical practices. . . focused on “doing”, every setback has an opportunity hiding just behind it. resilience, tolerability, empowerment.” (Participant 36452).

3.4.4. Deep Development Type 4: Making Stronger Connections with Other People

Fifteen DD participants described how the pandemic had enabled them to make stronger connections with other people, whether through a greater appreciation of friends and family, increased time at home with their immediate family, feeling closer to colleagues, or meeting new friends through developing new hobbies and interests.

“It showed the amazing power in teamworking and how we all wanted to work together and pull through together.” (Participant 1122).

“I have had greater contact, closeness and support from friends in unexpected ways.” (Participant 9730).

“Contacting some family members more regularly via Skype and message that I wouldn’t have done so often before. Supporting one another—sending veggie boxes to keep each other going and trying to arrange fun things over the net. . . Largely I think community spirit has increased, more people seem to be looking out for one another and more aware of vulnerable or isolated neighbours. During the Thursday claps we regularly saw the same people and now we have continued to say hello when we see them which has made it a much nicer place.” (Participant 10752).

3.5. Negative Pandemic Effects Alongside Deep Development

All 26 DD participants also described some negative pandemic effects, broken down into the sub-themes below.

3.5.1. Negative Effects on Mental Health

In total, 25 DD participants described negative effects of the pandemic on their mental health, including stress and anxiety. A number spoke about feeling isolated and insecure or uncertain about the future.

“Increased levels of anxiety and sense of hopelessness at the beginning. Separation and worry about family in other countries. The volume of work. The loss of life and liberty.” (Participant 8146).

“I initially lost a lot of weight from anxiety. I’ve felt disconnected . . . and demotivated.” (Participant 9730).

3.5.2. Negative Experiences at Work

All 26 DD participants described negative effects of the pandemic on their working lives, including the stress of adapting to remote working and feeling disconnected from their colleagues. Many spoke about the increasing workloads and negative effects on work–life balance. Some reported this leading to poor patient care and reported patients’ mental

health worsening, including some suicides. Participants also spoke about the stress of supporting colleagues, and feeling, in turn, unsupported by management.

“Stress. We work with people who are often anxious, distressed and can be irrational in decision making at a time when anxiety is affecting the most stable of people. Feeling isolated from colleagues, missing the 5 min “what do you think” chats by the kettle; lack of reassurance when things get too much, Miss the offers of help from others and offering help to others when they need it. Having to offer reassurance to patients when I’m not feeling reassured myself. Worrying that patients won’t cope. Worried what is happening when you’re not physically seeing patients but equally for the health of myself and my family fearing that managers will push us to start seeing more patients face to face increasing our risk. Feeling managers have no idea of the increase in work through us being available by phone all the time.” (Participant 477).

“Stress, stress, stress. Changing and unclear guidelines. Worrying about patients suicide risk more than before—the things we suggest as important being less available.” (Participant 9622).

“Anxious, exhaustion, scared. alone, feeling that I cant support them because all of my time and energy is spent at work. My daughter said to me ‘I wish you weren’t a nurse and didn’t have to got to work like my other friends mummies’Bad knee jerk reactions from senior management. Stressful environment.” (Participant 36565).

3.5.3. Negative Experiences in the Family

Sixteen DD participants spoke about the negative effects of the pandemic on their family, including arguing more, the pressures of home schooling, and worrying about family members’ mental health.

“My partner took on full childcare responsibility and home. This added a lot of stress to his situation as he also had to work full time himself. I also worry about the effect on my teenage son longer term about how isolated he became from his peers.” (Participant 4614).

Participants spoke about missing physical contact with family who did not live with them and worrying hugely about more vulnerable family members. Deaths in the family, and not being able to mourn properly, were also reported by a few participants.

“My family live 130 miles away. Lockdown and having a Mum who was shielding was difficult—not seeing her (diagnosed with cancer during lockdown) was very challenging.” (Participant 20451).

3.5.4. Negative Experiences in the Community

Twenty DD participants spoke about the negative effects of the pandemic on their local community, including local services and businesses closing, a climate of fear leading to increased rates of aggression and intolerance of people deemed to be breaking social distancing rules, and the increased isolation and health risks faced by some vulnerable groups.

“Furlough had serious consequences for my community who are mostly in low earning jobs. This was devastating for a lot of families. We also saw a lot of elderly people sadly pass away. We saw mothers of infants desperately looking for their infants milk and nappies. I really saw an ugly side to people when we all feared scarcity of food and resources.” (Participant 1122).

4. Discussion

This is, to our knowledge, the first study to investigate the feasibility and utility of using the AART to systematically assess positive growth and negative experiences during collective personal and occupational stress, in the domains of self, family, work, and community. Applying this tool to evaluate 854 healthcare workers' response during the COVID-19 pandemic, we found a high completion rate (85%) when presented as part of a wider survey, and that the tool captured the frequent co-occurrence of both positive and negative developments in key life domains. Through an ideal-type analysis of 133 purposively sampled free text accounts of healthcare staff's experiences of the positive and negative effects of the pandemic, we created typologies of three levels of adversity-activated development (none, minor, and deep). Aligning with our hypotheses, female gender, post-traumatic growth scores on the PTGI, increased time spent connecting with family and friends, and new skills gained in mental health care were significantly associated with a higher likelihood of deep development. Contrary to our hypothesis, perceived management and UK public support were not significantly associated with development, whilst black and ethnic minority staff's accounts were classed as less likely to demonstrate deep development than white staff's. An in-depth thematic analysis of 26 staff accounts judged to reflect deep development uncovered four specific types of deep AAD: changes in life priorities, changes in coping, realising strengths and capabilities, and making stronger connections with other people. However, there were indications that the AART may be less accessible to some demographic groups if delivered as an online tool without personal guidance.

4.1. Interpretation of the Findings

All of the identified cases of deep AAD also reported experiencing negative pandemic effects across multiple spheres of life, including work, family, and community. All but one individual described negative effects on their mental health. Thus, the AART succeeded in capturing the full range of psychological and behavioural effects of the pandemic, and in demonstrating that such complexity of experience is compatible with deep AAD. Indeed, such complexity of thought and non-binary interpretation of one's experiences may be an important characteristic of deep AAD [8]. Deeper AAD as derived from the AART was significantly associated with higher PTGI scores, suggesting that the two measures are capturing related constructs. Deeper AAD also correlated significantly with factors shown to promote post-traumatic growth in the wider study sample and in previous research: time spent connecting with family and friends and new skills gained in mental health care [18,21,23,24,27,31,42,43]. Relatedly, social connectedness has been shown to protect soldiers from combat-related PTSD [44], and to predict positive personal development following occupational death exposure [45]. In a study of frontline nurses during the COVID-19 pandemic in China, perceived professional benefit was positively correlated with post-traumatic growth [27].

An initial state of feeling "overwhelmed" is the natural human (and animal) response to devastating experiences, when one is confronted by what is unexpected, unfamiliar, and unpredictable. Being overwhelmed means that one is in a state of high arousal (both physical and mental), which is beneficial by alerting the person to address unforeseen dangers [46]. It has long been known that a major consequence of being overwhelmed is also the diminishing of the capacity to process at all levels, e.g., perceptions, emotions, memories, assessment of situations, and planning for appropriate action [47]. With a diminished ability to process, affected individuals and groups may lose their capacity for complexity and resort to quick and makeshift forms of understanding that oversimplify their perceptions and understanding of events and experiences. The most common form

of such oversimplification in processing is polarisation, i.e., when people perceive events and experiences in restricting binaries, in 'black and white' terms [8]. A lack of cognitive flexibility was shown to predict poor mental health during the pandemic [48]. By contrast, our cases of deep development avoided binary thinking and demonstrated cognitive flexibility by recognising a variety of positive and negative impacts of the pandemic on their lives. Similarly, in a survey of NHS occupational therapists, cognitive flexibility was felt to promote wellbeing during the pandemic [49].

The identified deep AAD types reflect these new pathways and potentialities experienced as a result of the disorientation caused by the pandemic: new life priorities, new ways of coping, an increased recognition of one's own capabilities, and increased connections with others. The types of AAD we uncovered relate clearly to previous work identifying that AAD can be intrapsychic (enhanced self-awareness and a broadened world view), interpersonal (strengthened family and community bonds), and external (increased resources and opportunities) [16].

Whilst the high completion rate (85%) suggests that it is feasible to use the AART to systematically capture growth experiences in the context of large online surveys, there was a wide distribution in the numbers of words written, and significantly fewer words were written by male staff, black and minority ethnic staff, administrative staff, and pharmacists. The AART responses of staff classed as showing no development tended to be briefer than those classed as showing deep development, and, relatedly, the accounts of male and black and minority ethnic staff were significantly less likely to be rated as showing deep development than their female or white professional counterparts. Conversely, in our analysis of the predictors of post-traumatic growth as measured by the PTGI in the wider sample, PTGI scores did not differ significantly by gender and were shown to be significantly greater amongst black and minority ethnic staff [18]. Thus, the AART may be a less accessible way of capturing growth experiences for some demographic groups. This may particularly be the case when it is presented as part of an online tool for self-completion, rather than with the support of a therapist as per its original design. This may relate to cultural and gendered differences in self-reflection styles alongside barriers to accessing education. For example, women generally outperform men in written expressive ability [50]. Further, whilst completing the AART with the support of a therapist has been very well-received by clients during therapy sessions [8,11], participants varied widely in how helpful they found completing it on their own during an online survey, and without any accompanying written or oral explanation.

4.2. Implications of the Findings

The findings suggest the value of considering a range of effects of adversity upon individuals which allow for complexity and flexibility in how participants reflect on their experiences. The findings also highlight the conceptual significance of AAD as a construct that relates to post-traumatic growth alongside offering the ability to assess both positive and negative outcomes in staff's own words and to use these to distil the levels of overall self-development. Follow-up studies should explore alternative ways of assessing AAD in a research context, such as brief interviews rather than written accounts, which may be more accessible across different demographic and professional groups. Case studies suggest that it can be helpful to explore AAD in a therapeutic context within both acute and longer-term crises, as long as this is facilitated within the context of a supportive therapeutic relationship [8,11,12]. Further research could continue to investigate the utility and effects of assessing AAD in a therapeutic context, both within acute and longer-term crises. The AART has been used all over the world, including with refugees with a variety of ethnic and national backgrounds in the UK, Greece, and India, with survivors of an earthquake in

Taiwan, and with people currently experiencing conflict all over the world [8,11,12,15–17]. Whilst this provides preliminary evidence of its crosscultural validity, culturally sensitive ways of exploring AAD within a therapy context should continue to be investigated. Social connection with colleagues, friends, and family predicted higher levels of AAD, whilst perceived support from managers did not. This reinforces the critical role of social support both in staff's immediate connections with their peers in everyday working life, and outside of the workplace. Employers' fostering of opportunities to connect socially with peers, and promotion of work–life balance, may help to facilitate employee growth during experiences of individual and collective adversity [51]. Developing greater skills in mental healthcare also predicted higher levels of AAD. The COVID-19 pandemic necessitated the rapid development of new ways of working for mental health workers [4]. Despite the stress professionals were under, our findings and those of others suggest that the professional development engendered by adapting to extreme collective occupational stress such as the pandemic can be a valuable contributor to personal growth through adversity [52].

4.3. Strengths and Limitations

We applied a novel method for conceptualising and assessing adversity-activated development, allowing the first empirical investigation of a construct which has the potential to complexify our understanding of growth responses through adversity. Sampling via NHS Trusts rather than through social media arguably resulted in less selection bias [53]. We were able to sample a range of different healthcare settings and healthcare professions, including both urban and semi-rural localities, and staff directly involved in care and those not. The proportion of black and minority ethnic staff in the sample (27%) is representative of that within the wider UK NHS workforce (22%) and within the participating Trusts, as is our proportion of male staff participants (23% in the wider UK NHS workforce). Our purposive sampling for the qualitative data analysis meant that black and minority ethnic staff experiences, and male staff experiences, were prevalent within the dataset. However, the low response rate to the survey (3%) could have created a sample population that was particularly motivated to reflect on positive and negative pandemic effects. Potentially, people with more extreme positive or negative pandemic experiences, or with more time or propensity to engage in self-reflection, could have been more likely to take part. This could have skewed the AART responses towards higher levels of AAD, as well as underrepresenting professional groups who are primarily hospital-based (who may have less opportunity to complete online surveys). Regardless, a range of levels of adversity-activated development were observable in the data. Additionally, we were not sufficiently powered to detect small effects of staff characteristics and questionnaire ratings on their level of adversity-activated development.

5. Conclusions

The findings show that AART can usefully assess both positive and negative growth following adversity, enabling respondents to convey the complexities of their experiences in their own words, whilst allowing the levels of overall self-development to be distilled. Completion of the AAD tool with the support of a therapist or researcher may enhance its accessibility for all demographic and professional groups. The accounts of healthcare staff experiencing deep adversity-activated development were characterised by changing their priorities in life, changing how they cope with life, realising their own strengths and capabilities, and making stronger connections with other people. Our findings on predictors of AAD reinforce the value of employers promoting work–life balance, collegiate support and social connectedness, and the development of professional skills, in order to facilitate employee growth during experiences of individual and collective adversity.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/occuphealth1030034/s1>, Box S1: Instructions given to participants for completing the AART grid; Table S1: Exemplar quotes for no, minor, and deep positive self-development; Table S2: Association between staff characteristics and number of words written about positive self-development.

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Abbreviations

The following abbreviations are used in this manuscript:

AAD	Adversity-activated development
AART	Adversity-activated development reflection tool
COVID-19	Coronavirus Disease 2019
CI	Confidence interval
DD	Deep development
ID	Identity
IRR	Incidence risk ratio
M	Mean
NHS	National Health Service
OR	Odds ratio
PTG	Post-traumatic growth
PTGI	Post-traumatic growth inventory
PTSD	Post-traumatic stress disorder
sd	Standard deviation
SFCA	Severe form of collective adversity

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