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Paramedic experiences of providing care in Wales (UK) during the 2020 COVID-19 pandemic (PECC-19): a qualitative study using evolved grounded theory

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ABSTRACT

Objective To explore paramedic experiences of providing care during the 2020 COVID-19 pandemic and develop theory in order to inform future policy and practice.
Design Qualitative study using constructivist evolved grounded theory (EGT) methodology. One-to-one semistructured interviews were conducted using a general interview guide. Voice over Internet Protocol was used through Skype.
Setting Conducted between March 2020 and November 2020 in the Welsh Ambulance Services National Health Services Trust UK which serves a population of three million.
Participants Paramedics were recruited through a poster circulated by email and social media. Following purposive sampling, 20 Paramedics were enrolled and interviewed.
Results Emergent categories included: Protect me to protect you, Rapid disruption and adaptation, Trust in communication and information and United in hardship. The Basic Social Process was recognised to involve Tragic Choices, conceptualised through an EGT including Tragic personal and professional choices including concerns over personnel protective equipment (PPE), protecting themselves and their families, impact on mental health and difficult clinical decisions, Tragic organisational choices including decision making support, communication, mental health and well-being and Tragic societal choices involving public shows of support, utilisation and resourcing of health services.
Conclusions Rich insights were revealed into paramedic care during the COVID-19 pandemic consistent with other research. This care was provided in the context of competing and conflicting decisions and resources, where Tragic Choices have to be made which may challenge life's pricelessness. Well-being support, clinical decision making, appropriate PPE and healthcare resourcing are all influenced by choices made before and during the pandemic, and will continue as we recover and plan for future pandemics. The impact of COVID-19 may persist, especially if we fail to learn, if not we risk losing more lives in this and future pandemics and threatening the overwhelming collective effort which united society in hardship when responding to the COVID-19 Pandemic.
Trial registration number IRAS ID: 282 623.

Strengths and limitations of this study

► The study was set up rapidly in one UK ambulance service very early in their response to COVID-19. This was a unique opportunity to capture experiences of Paramedics providing care as the pandemic unfolded.
► A rich evolved grounded theory has been constructed on the Tragic Choices in providing paramedic care during the 2020 COVID-19 pandemic, but is limited by being conducted in one ambulance service.
► Remarkable consistency and agreement was found throughout analysis, member checking and previous studies which adds to the trustworthiness and transferability of our findings.
► Using the Voice over Internet Protocol of Skype was deemed a strength, especially in the context of a pandemic due to social distancing. Technical difficulties did occur and one recording became corrupted.
► The research team included insider researchers with three practising paramedics and while this may be considered a potential bias, we stated up front the constructivist nature of evolved grounded theory and how the background of these researchers added to the richness of the grounded theory.

BACKGROUND

The SARS-CoV-2, the virus responsible for COVID-19, was first reported in December, 2019 in China.[1] COVID-19 rapidly spread across the world, qualifying as a global pandemic by the WHO (2020) on 11 March 2020, affecting 220 countries, areas or territories, with 54 558 120 confirmed cases and 1 320 148 deaths as of 11 Nov 2020.[2] In the UK, plans prepared in the aftermath of the 2009 H1N1 global threat were enacted,[3] which included the response from ambulance and wider health services and also wider societal measures including isolation methods, closing schools, businesses and self-isolation[4]

Prior to the COVID-19 pandemic, calls were repeatedly made for healthcare workers (HCWs) in the UK to ready themselves for such pandemics,[5 6] which may involve difficult and ethical challenging decisions shaped by the local context and cultural values.[7] HCW's face personal challenges and fears related to isolation, contracting disease, mortality and infecting family during pandemics.[8–12] The COVID-19 pandemic presented a unique opportunity to understand these issues from a UK paramedic perspective, and a programme of research was developed by our team to explore paramedic experiences of providing care during the 2020 COVID-19 pandemic (PECC-19). We conducted an initial review of the literature which found a paucity of published research concerning paramedics along with many of the challenges reported above.[13] The present paper reports the finding of a qualitative study we conducted which aimed to explore paramedic experiences of providing care during the 2020 COVID-19 pandemic and develop theory in order to inform future policy and practice.

METHODOLOGY

Strauss and Corbin's[14] evolved form of Grounded Theory (GT) methodology was used, which follows a constructivist perspective and accepts that people construct the realities in which they participate and thus highlights the researcher–participant dyad and the co-construction of data.[15] In Evolved GT, the researcher is a 'passionate participant as facilitator of multi-voice reconstruction' (Lincoln & Guba 2005 p. 196).[16] Three researchers within this study were practising paramedics and provided (limited) front-line care during the 2020 COVID-19 pandemic which in turn facilitated insight, awareness and ability to bring meaning to the data.[17] Such background does though have the potential for preconceived ideas and previous encounters to influence the construction of the evolved GT, and to counteract this, member checking and reflexivity methods were employed.

Setting and sampling

The study was conducted between March 2020 and November 2020 in the Welsh Ambulance Services National Health Services (NHS) Trust (WAST) UK which serves a population of three million. Participants were recruited through a poster circulated through email and social media. Information packs were sent to participants containing a consent form to sign and return to the researcher; confirmed verbally during interview. Participants were selected using purposive sampling based on the characteristics of gender, age, experience and educational development to reflect the paramedic workforce. Confidentiality and anonymity was assured.

METHODS

Data collection

Interviews

One hour, one-to-one semistructured interviews were conducted using a general interview guide (online supplemental file 1). The internet carriage service Skype was used, which is a Voice over Internet Protocol (VoIP).[18] VoIP was beneficial in the COVID-19 pandemic context as paramedics are a scattered workforce, practising social distancing during the study and this approach minimised time needed away from clinical duties to participate. Interviews were video recorded with memos taken, transcribed verbatim and checked for accuracy against the recordings.

Patient and public involvement

As this study was rapidly set up and due to the context of WAST responding to COVID-19 we did not involve patients or members of the public. We do however intend to present our findings to public and patient groups.

Data analysis

Analysis followed Strauss and Corbin's[14] three levels of open, axial and selective coding entered into NIVO V.12 software to create a coding book. Open coding compared data for similarities, differences and questions regarding emergent phenomena resulting in identification of indicators; words or phrases of interest. Indicators were subsumed under higher level headings known as concepts, which stand for the emerging phenomena. Axial coding involved subsuming concepts into higher-level headings known as categories. Selective coding also involved 'explication of the story line' (Strauss and Corbin 1998, p. 148)[14] which involves identifying the basic social process (BSP) at work, around which all other categories revolve. The BSP meaningfully and easily relates to all other categories and should have clear and grabbing qualities[19] on which to theoretical construct the evolved grounded theory (EGT) through weaving all of the fractured data back together and conceptualising the relationship among these three levels of coding. A second researcher (CH) independently reviewed this coding. Participant's also member-checked data analysis by reviewing excerpts from the coding book and returning comments on evolving theory. Reflective notes were made by researchers considering theory development and monitoring the researchers' influences on this process.

NHS Research Ethical review was not required within Health Research Authority guidance,[20] but issues of an ethical nature remained which were observed by following the Economic and Social Research Council[21] framework. Participants provided verbal and written consent. All data were collected and stored in accordance with General Data Protection Regulations (GDPR 2018)[22] regulations. We recognised staff may become emotionally upset during the research, and a range of support was made available.

Table 1 Sample of paramedic participants

Participant	Gender	EMS experience	Age range	Self isolated	Paramedic educational development	Interviewed
P01	Male	>10	26–45	No	Traditional training	PILOT 1 - 09/04/2020
P02	Female	3–10	46–55	Yes	Higher education	PILOT 2 - 09/04/2020
P03	Female	>10	46–55	Yes	Traditional training	Interview 3- 16/04/2020
P04	Male	>10	26–45	No	Higher education	Interview 4 - 20/04/2020
P05	Female	1–3	26–45	yes	Higher education	Interview 6 - 20/04/2020
P06	Female	>10	46–55	No	Higher education	Not Sampled
P07	Female	3–10	26–45	Yes	Higher education	Interview 5 –20/04/2020
P08	Male	3–10	26–45	Yes	Higher education	Interview 7 –23/04/2020
P09	Male	1–3	19–26	No	Higher education	Interview 16 - 21/05/2020
P10	Female	>10	26–45	No	Higher education	Interview 10 - 30/04/2020
P11	Female	>10	26–45	Yes	Higher education	Interview 8 - 28/04/2020
P12	Male	>10	26–45	No	Traditional training	Interview 9 - 29/04/2020
P13	Female	3–10	26–45	Yes	Higher education	Interview 15 - 20/05/2020
P14	Male	>10	46–55	Yes	Traditional training	Interview 14 - 19/05/2020
P15	Female	1–3	26–45	Yes	Higher education	Interview 12 - 05/05/2020
P16	Male	>10	56–60	No	Higher education	Interview 13 - 07/05/2020
P17	Male	1–3	Incomplete	No	Higher education	Interview 11 - 04/05/2020
P18	Male	3–10	26–45	Yes	Higher education	Interview 17 - 27/05/2020
P19	Male	3–10	26–45	Yes	Incomplete	Interview 18 - 03/06/2020
P20	Male	>10	46–55	Yes	Traditional training	Interview 19 - 02/07/2020

RESULTS

Twenty-six paramedics responded to the poster call, six did not end up participating and a final sample of 20 were consented and enrolled into the study. One paramedic was not interviewed due to purposive sampling and one of the interview recordings became corrupted and not included in the analysis. Table 1 includes characteristics about the sample of paramedic participants.

The following four categories emerged: Protect me to protect you, Rapid disruption and adaptation, Trust in communication and information, United in hardship. The BSP in PECC-19 was recognised to involve Tragic Choices and was conceptualised in the EGT in figure 1 which involved Tragic personal and professional choices, Tragic organisational choices and Tragic societal choices:

Category 1: protect me to protect you

All of our paramedic participants except one expressed concern for themselves and their families during the pandemic due to a perception of the risks their occupation posed:

> Not so much catching it myself, but bringing it home to my family (P09)

They were concerned of risks to family members with underlying health issues, revealing internal conflict between their occupational role and the safety of their families. A wide range of underlying conditions were

reported including pregnancy, asthma, immunosuppression (HIV negative) and leukaemia, and participants often mentioned concern for family members from these vulnerable groups and their elderly relatives.

> my partner works as a frontline carer, he is immunosuppressed but is HIV negative… he has got significant risks, but obviously with me working in the frontline, and him in frontline as well, one of the early fears were do we basically separate or do I basically separate from him to reduce that risk. Whilst I would always do my job, I would never forgive myself if I thought for one moment that I had brought something from the community and brought it back home (P08)

Paramedics told how practising in this context was unlike anything they had experienced before, with an ever-present sense of fear and risk.

> I felt anxious going to work, I felt scared going to work, it's scary to think you can go to work and bring it home, that is not a nice feeling (P12)

All participants talked about front line HCW's dying from COVID-19, and in April 2020, a paramedic within the study area died from COVID-19. From this point on all of the participants reflected on the death of their colleague, as shared by paramedic 14:
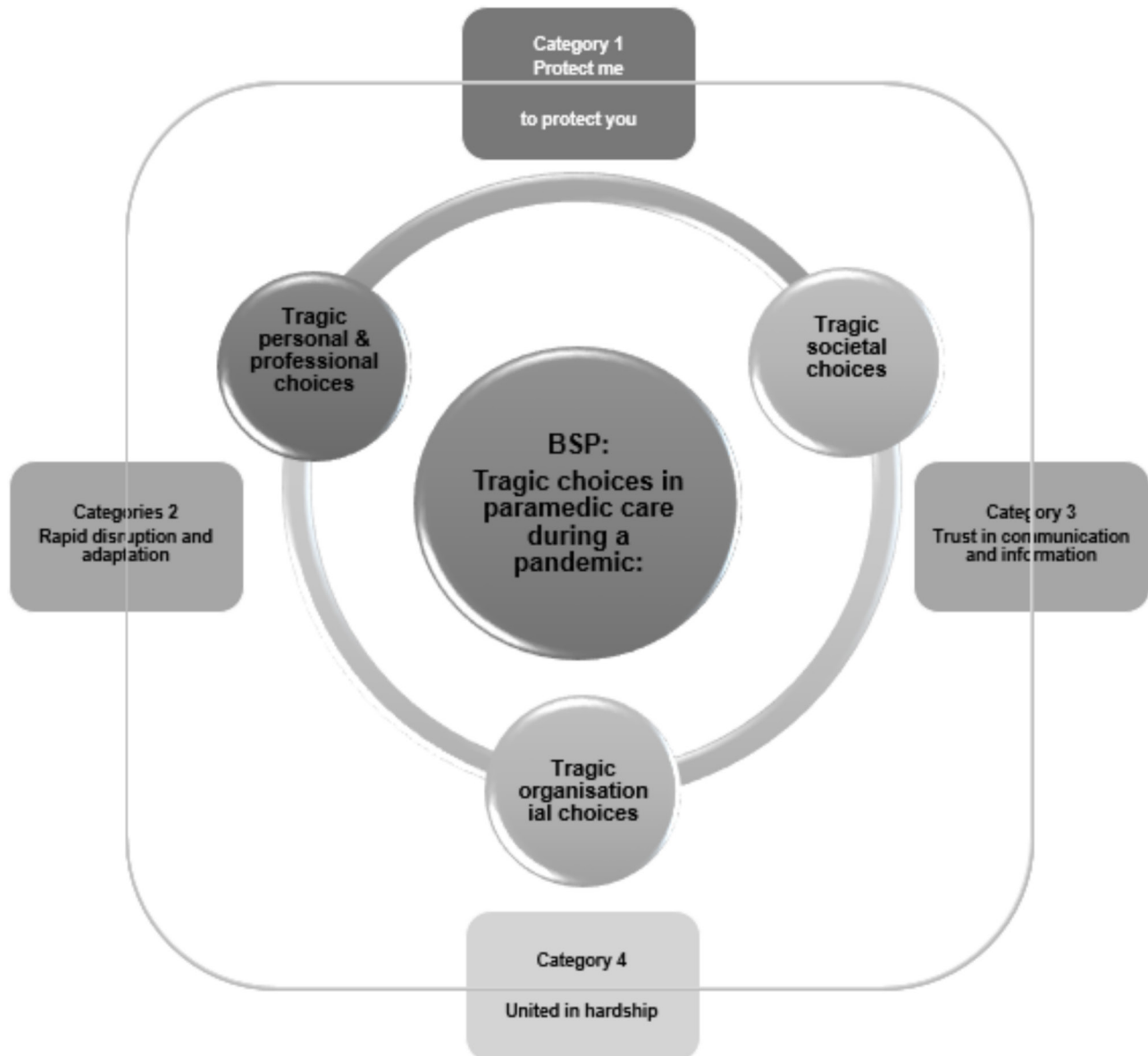
Figure 1 Evolved Grounded theory (EGT): Tragic Choices in providing paramedic care during the 2020 COVID-19 Pandemic. BSP; basic social process.

We have [name] working here… its knocked it a bit closer to home again,….it's had a massive effect because he was such a big character (P14)

Powerful accounts were relayed of their sustained exposure and close proximity to patients with COVID-19 symptoms. Paramedic 15 who contracted COVID-19 along with her partner early in the pandemic, said prior to contracting COVID-19 she:

was petrified really, standing in a house where someone is coughing and spluttering for half an hour, and then conveying them to hospital, which took another hour…you are in the back of the vehicle 2 meters by 1 meter… with a patient who is coughing virus into the air potentially and I'm breathing that air in. so it was horrible really. (P15)

They reported attempts being made to mitigate the risks of working in this environment, which involved changes in practice and provision of personnel protective equipment (PPE). Such efforts however did little to alleviate this fear-filled context, which seemed to influence their morale. Paramedic 15 was:

really worried because I knew the masks didn't fit me properly, so I was anxious and I felt a bit demotivated to be in work, that I didn't want to be there because every day I was going in and it was a permanent risk really' (P15)

Paramedics in our study reported this environment of fear influenced many areas of their lives, including changes to hygiene practices such as changing out of their uniform and showering in work, avoiding visiting

friends and relatives, and talking more openly on making preparations for their own death. They also reported a dramatic reduction in workload and that people were avoiding care for fear of contracting COVID-19 which they felt was influenced by the media and conversely increased emergency calls to assess people who thought they had COVID-19.

> There was a lot of fear among patients, which I can understand. You see a lot of death and fearmonger-ing on the news, there was a lot of fear among pa-tients. But then that also led to frustration amongst us on the road because we are going to patients who are phoning 999 because they have a bit of a cough. They basically phone us because they want us to check them over (P12)

Paramedics were sympathetic to these views, and admitted to their own internal conflicts when taking people into hospital, which they felt may not be in the best interest of their patients. A clear narrative for this dilemma was described by P15 who was unable to safely leave the patient at home, and was admitted to a COVID-19 ward

> When I took the gentleman in who was off his legs to the COVIDCOVID-19 ward, I was talking to the nurse there and I said I felt like I was deciding almost his fate, which wasn't very nice. (P15)

Paramedic participants raised occupational and pay related issues including the importance of protecting their income while acknowledging their fortunate posi-tion in comparison to others in society at this time.

> I am alive and I have a job which is more than what most people have got at the moment. I have food and I'm not worried about bills (P10)

Additional overtime incentives were initiated by their employer, and whist views were mixed, paramedic 10 told of her fear in taking on overtime:

> I have no intention of doing overtime……Less is more with me I think, it's like Russian roulette isn't it, you know the bullet is in the barrel and you will spin it because you have to go to work, but then I wouldn't go and put two or three more bullets in the gun and spin it to take that chance (P10)

All participants except one had access to the recom-mended PPE, but they also reported frustrations on how PPE guidance had changed as the pandemic evolved and experienced variation in approaches to PPE across organ-isations other home nations.

> there seems to be substantial differences between what Public Health England and Wales are throwing out in regards to what the World Health Organisation and the Resus Council are throwing out (P06)

Concerns were reported over their training and the quality of PPE, and all except two felt it was not designed

for ambulance service use. Paramedic 14 shared his thoughts on the quality of equipment and reported his concerns around using out of date PPE:

> we are using masks now with stickers with 2012 on and I know that we are only using them because we can't get any of the newer masks, and that is not what you want to hear…you want to know what you are wearing is safe to do your job. (P14)

Nine of the participants reported that their well-being and mental health had been negatively impacted on by the pandemic. They talked about their collective anxie-ties around COVID-19, and the effect the ever-presence of the virus in their practice. Paramedic 9 said:

> as a station we were definitely a little on edge. Cleaning door handles in the station, going round starting my shift, cleaning any touchable things I could think of, kettles, taps anything like that and that is not me… it's turned me into a bit OCD about it. It's definitely affected my mental health (P09)

Paramedics talked about the difficulties they felt in providing care in emergencies due to COVID-19, and how this resulted in frustrations and tension in them.

> one night, unfortunately, I had 3 cardiac arrests, which was tough and unfortunately the guy I was working with needed the versa flow hood, so I was on my own…that was really really hard going on your own… everything about it felt wrong and it was such hard work and it was frustrating. (P12)

Only one participant reported having accessed well-being or mental health support promoted or provided by their employer, and this was a routine call from the well-being team with support which they declined. Partic-ipants did however reflect on the increased focus and provision of support for mental health within ambulance services in recent years.

> I think the mental health side of it is 100 times better than what it was, I don't think we had anything before (P14)

Despite this, participants either did not feel they needed such support or accessed this from other sources such as their family, friends, colleagues, private counsel-lors, the service Chaplain or information publically avail-able. Following the national lockdown our participants described the importance of exercise, being outdoors and in nature for their well-being during the pandemic, along with the need for time to recover between duties. They told how the pandemic had resulted in them doing more activities with their families and had rekindled interest in activities such as walking and cycling. Para-medic 10 shared how during lockdown, the 1 hour a day out walking was so important and:

> But I have started back cycling, that was one of things I was allowed to do, so the bike has been covered with

a blanket in the garage for months, and because you were allowed to cycle and pretty much nothing else, I started again. (P19)

Categories 2: rapid disruption and adaptation

All participants faced rapid disruption to their personal and working lives. This included issues such as adhering to the lockdown rules, social distancing, holiday cancellations and difficulties visiting family. This rapid disruption subsequently required rapid adaptation.

when you find yourself in a situation whereby the world is a completely different place so quickly you have to adapt, you have to (P7)

They told of the need adapt, learn and assimilate new information quickly. This included clinical information around the COVID-19 virus, clinical guidance and ways of working in PPE. Paramedic 12 shared how it could be overwhelming:

you have been thrown information constantly, there's updates after updates after updates, things are changing near enough I wouldn't say hourly but frequently changing. Yes you are probably being suitably informed but it is overwhelming (P12)

All of the paramedics reported the rapid change in encountering patients reluctant to accept care, and how they faced difficult clinical and ethical decisions in their practice which had become far more challenging due to the context of the pandemic.

I would say at least about 50% are refusing to go in…. so you are really having to convince and weigh up the balance of fighting against that, because if you do take them in and they do catch it and they do die, its weighing up the responsibility of that as well (P05)

And

I spent nearly an hour and a half trying to convince the family that the risk factors were significant enough that actually going to the A&E and so did the doctor … 2 and a half hours later we did manage to gain consent to wilfully go to hospital (P07)

Paramedics also said people were presenting much sicker due to delaying care for fear of contracting COVID-19 as expressed by P07:

People are really poorly out there because they are leaving it too late (P07)

All of the paramedics faced changes to clinical practice and guidance and while there were mixed views, for some, information felt rushed.

I feel they were pushed out too quickly without adequate training and understanding from frontline crews, and I fear this will lead to risky decisions being made that would not otherwise benefit the patients (P11)

There was also a suggestion that during the pandemic, a more pragmatic approach was being taken to clinical practice guidelines and the quality of care was being compromised. Some paramedics expressed concerns about their professional registration:

The HCPC [Health & Care Professions Council] came out early on and said they will make allowances, they will consider the coronavirus if our decision making is called into question (P18)

The pandemic was thought to have expedited many changes in clinical practice including in end of life care (EoLC). Powerful accounts were shared of managing patients at the end of life during the pandemic which avoided delays and hospital admission, which gave them satisfaction. Paramedic 18, however, told of his discomfort over EoLC treatment packs, telling how he and his colleagues were:

Uncomfortable about it because they have just been put on trucks with very little training on it (P18)

Paramedics in our study said how their interaction pre-pandemic with people with mental health issues was often tactile, involving holding hands and using nonverbal communication. Participants explained how the pandemic had significantly changed this.

the human side of our job feels like it has been taken away, and its really put into sharp contrast how much humanity we usually have in our job … personally I have found it really difficult leaving relatives behind and especially when you have got time critical, possibly not going to survive patients. We had a lady with a very dense CVA the other day…and had to leave her daughter standing crying on the side of the road. (P03)

And

Before you would go in and have chats or banter with them its lost all that, first thing you do is put a mask on them, it can't be nice for the family coming in with all this stuff on, and I think its lost a lot of that relationship between the paramedic and the patient (P14)

All of the participants except one reported a rapid rise in the use of technology in their personal and working lives such as video conferencing and mobile phone apps.

I speak to my children on a daily basis by phone or group video, which is something else we have got into the habit of doing now. We will get into a group call which we have never done before (P13)

They also shared the positive impact of the pandemic on use of such technology across the wider healthcare system:

The NHS in regard to medical advances has been very fearful in moving forward, particularly with

video conferencing and now seeing GPs using Zoom, which is amazing (P07)

Categories 3: trust in communication and information

All of our participants accessed information from a wide range of sources, and told how trust in information sources was essential. For some, there was general confusion on what sources could be trusted:

I don't know who to trust with it (P12)

There were mixed views on information provided by the Government; for some there was distrust in their motives, and a feeling information was being politicised with the government being careful to protect themselves.

Because they [the Government] have done that to protect themselves and not us as healthcare workers… the thing is, you don't really know from what you're seeing how true everything is. (P12)

Eleven of the paramedics felt suitably informed by their employer, and provided rich accounts of the many platforms and mediums that were used in this process, such as the:

excellent policy of daily updates and ZOOM meeting to ensure all staff were aware of the latest updates (P01)

They did however report how the constant negative reporting of COVID-19 was having an impact on the kinds of presentations they were encountering in their clinical practice:

Those people were saying they were watching the news 24 hours a day, all the media reports, googling things they didn't know about and getting themselves into a point they end up calling us through stress. So very bizarre times. (P16)

All participants told of the danger of information overload for them and the public. They also believed social media could be negative and positive. Positive accounts included its role in communicating with colleagues, friends and family and the Facebook group provided by their employer. Some however did not use social media and avoided it to protect their mental health. Media reports providing daily updates and reporting the challenges they faced were a constant reminder of their job and were not welcomed and created anxieties and difficulties with loved ones.

I try not to watch the news, and I mean I had it on constantly, and I realised it was having an effect on my daughters mental health (P10)

During the early stages of the pandemic, many front-line staff including paramedics took to social media posting pictures and videos of themselves which ranged from messages of protecting the NHS to highly choreographed dances in theatre scrubs, PPE, nursing and clinical uniforms. Paramedic 10 said:

I don't think it is right that we are posing in masks, and I mean the medical professional as a whole, dancing up and down the corridors meters away, potentially from ITU where people are fighting for their lives… you wouldn't get a crematorium bloke doing a song and dance in a crematorium would you (P10)

Categories 4: United in hardship

Despite the significant challenges and fear, Paramedics reported a sense of solidarity across their profession and organisation in being united working together to tackling the pandemic.

I think generally people come together in a crisis normally and I think it's taken this to make WAST and other services a lot nicer place to work for. Because we are all up against it though aren't we, we are in it together (P10)

They also told of the positive aspects of the COVID-19 pandemic on the communities within which they lived and worked and recognised that the visible public support such as gifts and clapping was nice, but some felt somewhat embarrassed

It's really nice to get to know that you are supported, it is emotional, but I do get somewhat embarrassed by it, because we are out there doing a job and decisions we make are informed decisions. (P13)

During the pandemic there was a very visible campaign in the media of NHS Heroes. This narrative was promoted within society by charities, media and government. Despite this, all of the participants except one did not consider themselves to be 'Heroes' but rather, felt they were just doing their job.

What is the definition of a hero?… I go to work every day, and I know if I caught it I know my dad would call me a hero, I know my daughter would be beside herself but eventually she would probably think of me as a hero, but yeah I would be a liar if I didn't say there were times I think of myself as a hero, but ultimately I am a human being who is scared (P10)

The heroic definition of paramedic 10 was equally reflected in the accounts of the other paramedic participants, who all felt a professional responsibility to society to provide care during a pandemic but would not choose to be exposed to such risk if they had a choice and shared a sense of melancholy that if they weren't doing this, who would be?

We have lost colleagues, and if this virus wasn't here they would be around now, and that isn't what you expect when you become a paramedic I don't think. I never expected a global pandemic which could kill us to happen (P15)

The outpouring of public support for paramedics within the NHS did however reveal tensions in their relationship with some members of society. Paramedics told how some in society were blasé, not observing social distancing rules, and the Victory in Europe (VE) day celebrations were cited as examples. It was suggested by paramedics that when COVID-19 was over, they would be forgotten about by the public and return to long hospital delays, inappropriate use of ambulances and violence and aggression directed towards them

> once it's over they will forget about us again and it will be back to abusing people again and sitting around in hospitals and where has this been until now when you needed us (P14)

BSP: Tragic Choices

The BSP in PECC-19 was recognised to involve Tragic Choices. We draw on the work of Calabresi and Bobbitt[23] who explored how societies allocate tragically scarce resources and make such 'Tragic Choices'. This perspective considers the various methods for allocating and dispensing goods and services with paramedics during a pandemic, which includes resources such as equipment, labour, knowledge and information, care and services. The BSP reflects life's pricelessness and Calabresi and Bobbitt's[23] discussions on such pricing of the invaluable and the cost of costing, which we argue occurs when ordinary activities and resources become increasingly scarce and tragic in a pandemic.

Calabresi and Bobbitt[23] highlight that price does not place a value on goods or activities, but rather, it permits comparisons, such as the cost of investing in healthcare, preparing for pandemics, PPE and pay, all of which can be compared in price with other activities such as building safer roads for instance. These prices do not however place a value on life, but when compared, they can illuminate the cost; for example, of how many lives may be saved by building safer roads rather than spending on building new hospitals for instance. The informative worth of price, costs and the value we assign to issues revealed in this study on paramedic care cannot therefore be ignored, or otherwise we risk losing more lives in this and future pandemics, and paradoxically undermine life's pricelessness.

An EGT of the Tragic Choices in providing paramedic care during the 2020 COVID-19 pandemic

An EGT was constructed of the Tragic Choices faced by paramedics in providing care during the 2020 COVID-19 pandemic. Exploration of the Tragic Choices that such pandemics necessitate reveals the variety of processes by which these choices are made across the thematic categories presented above, and outlined in the EGT (figure 1) which includes the BSP of Tragic Choices at its centre, influenced by Tragic personal and professional choices, Tragic organisational choices and Tragic societal choices.

Tragic personal and professional choices

Challenging personal and professional choices were experienced by paramedics in our study around protecting themselves, their families and their duty to provide care during the pandemic. While the public considered them heroes, paramedics did not consider themselves within this characterisation. Many definitions of heroism to society exist, but key factors include: the voluntary nature, risk of harm, acting for benefit of others and without expectation of gain.[24–26] Our paramedics were indeed acting in the benefit of others, but reported feeling scared and it was a job they were paid for. Tangherlini[27] found similar self-deprecatory accounts from paramedics of such heroic status and so acceptance of such hero characterisation is complex.

Tragic professional choices were revealed in clinical practice; especially with PPE, including its dehumanising impact, frustrations over quality and variation in guidance across organisations. Such disparity in guidelines have also been reported in the literature.[28] They faced rapid changes in their role in provision of EoLC, which some were not confident in, and while studies have previously reported this,[29–33] empowering staff at the point of delivery of EoLC has been deemed crucial and can make a real life impact.[30] The pandemic may have expedited developments in paramedic provision of EoLC and tragic decisions may have been made. However, powerful positive EoLC encounters were reported by paramedics which may reflect professional and organisational growth which can emerge from such crises.[34 35]

Tensions were revealed with clinical decisions, balancing risks and benefits of managing patients at home. These decisions may again involve Tragic Choices and moral compromises which HCW's are often confronted with and can have far-reaching consequences when searching for the best treatment option[36 37] Hoffmaster& Hooker (2013) [37] contend that often policy makers are removed from the devastating heartbreak, sorrow and guilt of personal Tragic Choices and consequently, the moral burden of legitimacy and responsibility falls not just on the Tragic Choice itself, but also on how the Tragic Choice is made. Paramedics in our study reflected on the cost of isolation measures and anxiety in patients; many of whom were elderly and experiencing increased loneliness. Such feelings of loneliness, and anxiety during the pandemic have been reported elsewhere,[38] with the elderly and those with chronic conditions said to be paying the highest price due to increased age and disease related risks.[39 40]

Ethical and professional issues revealed around the paramedic-patient relationship, have been reported in other studies,[41–44] and have potential to result in moral injury, which is the psychological distress that results from actions, or the lack of them, which violate someone's moral or ethical code.[45] Powerful accounts of Tragic Choices may also reinforce public drama, with reports in the media of paramedics constantly second-guessing themselves as to whether people needed to go

to hospital, and choices that may 'make a patient better or kill them'.[46] Family members, friends and the wider public received daily reminders of their role, and risks they faced, and paramedics in our study told how they could not escape these reminders when off duty.

The tragic professional and personal choices being made by paramedics in our study were also experienced by others during the COVID-19 pandemic,[47] who similarly reported such challenging decisions, balancing physical and mental healthcare needs with those of patients, aligning their duty to patients with the needs of their family and friends, and providing care with constrained resources. They reported feelings of fear, anxiety, and reported Tragic Choices they made in seeking support, which rarely involved their employer, but rather family, friends and close colleagues. The positive impact of exercise and being in nature was reported, and many studies have identified the positive relationship between nature and good mental health and well-being.[48–51]

Moral injury can however have benefits, as those individuals and organisations who have endured such experiences during the crises have experienced post-traumatic growth.[34] Indeed, Rothes et al (2020) reported such professional growth and increased awareness in paramedics following their experiences with patients who died by suicide, but this relied on supportive cultures, training and preparation to overcome the negative emotional impact.[35] Once again, tragic and costly choices may be required to invest resources and mental energies in these issues.

Tragic organisational choices

Our study richly revealed the influence of many choices made by the paramedics employing organisation. The COVID-19 pandemic is undoubtedly the most significant crises to have been faced by healthcare organisations and ambulance services internationally in modern times, yet societal crises can be strategically challenging to organisations outside of the pandemic context, and the associated disruption of demand, capacity, increased uncertainty and financial instability forces a reassessment of business operations.[52 53] Ambulance services are in the front line response to the pandemic, and while preparations are made for such pandemics, the employing ambulance service were forced to learn, react and adapt as the pandemic unfolded. While rapid changes may have resulted in confusion and anxiety in areas of clinical practice and PPE, many positive issues emerged where the pandemic context appears to have stimulated a significant amount of innovation and cooperation. For instance, the organisation initiated more provision of clinical support, better information, communication and digitalisation, factors which may have created an environment for improved professional growth. It should be recognised that such accelerated innovation and growth was forced rather than discretionary, which can occur to ensure the organisation's survival and because it had to.[54]

Limited assumptions can therefore be made if such innovation could be sustained outside of a pandemic context.

Paramedics in our study reported the importance of trustworthy communication in their personal and professional lives during the pandemic, which has also been reported in previous pandemics[12 55 56]. They also reported challenges of information overload, how social media could be positive and negative and how some avoided it. Tragic Choices are therefore again made around communication, where the content and medium of such communication may be positive, but may also add to public drama, confusion and the tragic context.

The study revealed many positive cultural and organisational issues, such as increased unity which has been reported during other pandemics.[43 57] One such visible example of this spirit of solidarity and unity was WAST's 'Reach for the Razor' campaign,[58] where staff were encouraged to shave facial hair (light-heartedly) to prevent the limitations of face mask fit when hair is present. Organisations and staff, may therefore have choice in being in united in pandemics, but such unity may involve longer partnerships.

Increased problems with mental health and well-being were reported by participants, which are also reflected in literature[59–62]Kisely et al. (2020)[62] found HCW's during pandemics exposed to virus are 1.7 times more likely to develop psychological distress and Post Traumatic Stress Disorder (PTSD) compared with non-exposed workers. Few participants sought support in our study which is also reported in the literature.[10] Despite this, there are a lack of evidence based interventions for staff working in such high-risk occupational roles,[63 64] which has prompted urgent calls for research to be prioritised in this area.[65] Paramedic participants also reported incentives for working overtime during the pandemic, but many recognised the need for time off to recover; indeed working such overtime is associated with anxiety, depression and burn-out.[66–68] Paramedics and employing organisations therefore face Tragic Choices when balancing service delivery during a pandemic with potential for increasing mental health problems and access to evidence based interventions.

Paramedics in our study felt we were not prepared for the pandemic and appeared to accept the unique situation, yet preparations were made and experiences of previous pandemics reported in the literature. Billings et al[69] conducted a meta-synthesis of HCWs experiences of working on the front-line and views about support during COVID-19 and comparable pandemics. The results of this study were remarkably resonant with the themes within the present study and others Emergency Medical Services studies.[29 70] Issues faced in the COVID-19 pandemic were therefore not totally unprecedented and questions therefore emerge around such Tragic Choices and learning lessons from previous, current and future pandemics, and the role and synthesis of research literature.

Tragic societal choices

Paramedics and other HCW's were celebrated by visible campaigns of public support for the NHS through the media, politicians and Thursday night clapping and gifts. This context has echoes of Calabresi and Bobbitt's[23] notion that what counts as a Tragic Choice is in many ways a matter of public drama. Such public drama may have been influenced by campaigns such as the 'Stay Home, Protect the NHS, Save Lives' Protect the NHS' slogan, reinforced through daily briefings, reports of increasing hospital bed capacity, deaths by COVID-19 and frontline workers being unable to access PPE. Calabresi and Bobbitt[23] argue that when public drama in this way is central to designating tragic goods, society treats them as tragic when in fact, they need not have been tragically scarce, and devise an alternative allocation scheme to distribute them. Many of the choices and goods during usual times involve policy decision based on a range of factors such as clinical and cost effectiveness. Given warnings over the inevitability of a pandemic, questions therefore emerge from a public policy perspective around the role and influence of such public drama in decision making. As heart-warming as they are, such outpouring of public appreciation may misdirect attention from fundamental issues around our planning and resourcing of the current and future responses to pandemics, and indeed may be making these goods and services actually become more tragic in nature. We argue there may however be more choice inherent in the allocation and distribution of these issues, tragic as they may be, which led to the turning of ordinarily scarce resources into a tragically scarce ones, which again relates to value and the cost of costing.

Participants had been able to access the recommended PPE, but they also reported concerns over its quality, which has also been raised by other HCW's[71 72]. Societies and governments globally have faced problems with PPE supply chains, as prior to the pandemic, China produced half the world's face masks, and as COVID-19 spread across China their exports stopped.[73] This is a vulnerability to society which reflects how this ordinary resource quickly became tragically scarce and subject to much public drama. Pandemic preparations no doubt saved lives, but some suggest this response was neither been well prepared nor adequate,[74 75] and point to unheeded warnings over lack of preparation, including limited numbers of intensive care beds and PPE which were revealed at a time of austerity when bed numbers were being cut, which again highlights the Tragic Choices being made and potential subsequent costs.[75]

The high profile campaigns above along with directing of people to 111 as the first point of call, may have proved effective given increases in 111 calls and reductions in ambulance use of up to 16%[76 77] at a time when ambulance services had been experiencing record levels of demand and yearly increases of around 5%,.[78 79] Despite this, paramedics talked of patients avoiding care for fear of contracting COVID-19, which again has echoes of

Tragic Choices, as Hope and Dixon[80] suggest that the 'Stay Home, Protect the NHS, Save Lives' slogan was indeed too successful, and may have dissuaded people from going to hospital to treat other urgent conditions. Evidence is also emerging on such avoidance of emergency care and reciprocal increases in Out of Hospital Cardiac Arrests unrelated to COVID-19, along with stroke patients arriving too late to receive vital clot busting drugs.[81]

Paramedics predicted they would be forgotten about by the public after the pandemic and return to long hospital delays, inappropriate ambulance use and violence and aggression. Such a situation unfolded during the VE day celebrations, with reports of NHS staff having been stabbed in the back, with street parties and increases in intoxicated and violence patients assaulting staff.[82 83] These issues clearly threaten the notion of being 'United in Hardshi*p*' and questions emerge around the relationship between HCWs duty of care owed to protect society during a pandemic and societies reciprocal obligations to protect them. Self-sacrifice and martyrism of health workers played out as tragic public drama forces us therefore to confront such issues of trust and how society and governments reward and pay for its healthcare system and its workers[84 85]?

The Organisation for Economic Co-operation and Development (OECD)[86] found that 43.4% of NHS workers work up to 5 hours unpaid overtime per week, while 3.5% reported working more than 11 hours of unpaid per week. Huge variations were also found in investment in healthcare, with the UK investing £3257 per capita (9.8% of Gross Domestic Product (GDP), which is 18th of all OECD countries, despite being the fifth largest economy globally. This again highlights how governments and society cannot ignore the informative value of price, costs and the value we assign to paramedic care in pandemics. Every aspect from pandemic preparation and procurement of PPE to paramedic well-being may be informed by the price we are prepared to pay, how we value health services and the subsequent costs involved. Societies and governments will therefore continue to make Tragic Choices in this and future pandemics in order to protect unpriceable lives.

DISCUSSION

Due to the nature of Evolved Grounded Theory Methodology (EGTM), much of the discussion has been presented through narrative within this paper. We have achieved our aim oexploring paramedic experiences of providing care during the 2020 COVID-19 pandemic and developing theory in order to inform future policy and practice.which has been called for in the literature.[69] Much of our findings reflect what was already known from studies with HCW's in previous pandemics and may have been somewhat predictable. This highlights the need for pandemic planning and responses to be informed by the best available evidence. Conducting research within this

context presented a unique opportunity, and through swift mobilisation of our research team, development and approval of our study we were able to capture these data as the acute pandemic period unfolded. We have learnt much from our nimble and efficient approach to this study which may benefit future research with paramedics and during such crises.

Paramedic participants within our study were extremely concerned about their own physical safety and that of other family members which was articulated through the category Protect me to protect you. Such safety concerns are consistent with reports from this and other pandemics, and exacerbated by inadequate PPE, insufficient resources, and inconsistent information.[69] Adequate supply and appropriately designed PPE for the prehospital setting should be considered an urgent priority for the current and future pandemic. While participants were generally supportive of the information provided by their employer, they reported limited trust in wider information sources, especially from media and politicians, which could be a sources of support but also sources of stress as reported in this and other studies.[69] Protecting paramedics in order to protect the public during pandemics should therefore be a priority in this and future pandemics.

Participant's reports of their well-being and mental health being negatively affected are consistent with other studies.[51 61 65 69] Significant efforts had been made prior to COVID-19 to improve mental health and well-being support for ambulance staff, which was recognised by participants in our study. However, Clark et al[87] reported that despite a body of research on health and well-being of ambulance staff, there is little evidence on whether current actions are working. Our study however may reflect some progress, as staff talked openly about their mental health and well-being and gained support through colleagues, friends and the service Chaplain. Formal occupational health support through their employers however was not however generally valued or used, which is consistent with reports in the literature.[10] This should be of concern, and we therefore support calls from Clark et al[87] and others to further investigate strategies from an organisational and individual/ social level. Such strategies should consider the positive impact of exercise and being in nature as reported in this study, which is known to support well-being and mental health.[48–51]

The Tragic Choices reported within this study are influenced by ethical, moral and professional dilemmas. Paramedics reported feeling they were unable to deliver the standard of care they would usually provide, which has been reported in other studies, and may increase risk of moral injury.[45 69] It was acknowledged that moral injury during crises can result in post-traumatic growth,[34] and the many examples of rapid disruption and adaptation within this study may reflect such growth, especially around decision making. It should however be recognised that such growth relies on supportive cultures, training and preparation to overcome the negative emotional impact.[35] Future preparation for pandemics should therefore consider the findings of this study and focus on such issues in planning.

Moral injury can be a risk factor for further mental health problems and Billings et al[69] found it to be particularly pernicious in the context of COVID-19 and other pandemics, where many HCW's feel betrayed by their colleagues, organisations and society, some of which may have also been reflected in this study. Paramedics in our study reported the sense of being United in hardship, where the pandemic served as a unifying force in battling the common enemy of COVID-19. This unity was displayed across the organisation and society and even involved powerful militaristic metaphor such as 'Call to arms'. We suggest however that tragic societal choices where revealed through this relationship employers, society and government.

Early on in the pandemic, some HCW's including paramedics posted pictures and videos of themselves on social media ranging from messages of protecting the NHS to highly choreographed dances in clinical uniforms. Politicians, wider society and organisations also publically showed their support through social media and campaigns such as NHS Heroes. While paramedics in our study were appreciative of this support, they reflected self-deprecatory accounts reported in other studies of such heroic status, highlighting they were doing their job[27] and above all wanted to protect themselves and their families. They reported how they would be forgotten about by the public and return inappropriate use of ambulances and violence and aggression directed towards them. As the pandemic unfolded, some of these predictions were realised through reports of increased emergency are us during drunken parties VE day celebrations.[82 83] As we approached the anniversary of the pandemic, and look to recover, displays of unity within the media and literature may have been replaced by a sense of betrayal of HCW's.[88–90]

Powerful media and communication narrative and metaphor were employed during the pandemic, revealing tragic societal choices in relation to the relationship with paramedics and other HCW's. Militaristic, battle-like metaphors and unitedness in hardship within the media appeared to be replaced by a polarised narrative in later stages of the pandemic. Accusations have been made of a striking absence of any plan for long term recovery of health and social care services from the pandemic in the UK Government 2021 budget, which they argue is aimed at protecting the jobs and livelihoods of the British people.[91 92] Gone are the highly choreographed social media posts such as TIK-TOK items of NHS worker dancing in clinical uniforms. #NHS Pay Twitter Hashtag dominates social media in later stages of the pandemic.[93] Questions also remain around the influence of campaigns such as the 'Stay Home, Protect the NHS, Save Lives'[80] slogan, and if they were too successful and scared accessing emergency care as reported in this study by paramedics who reported fear among patients in accessing emergency care.

Strengths and limitations

The study was conducted in one ambulance service and is therefore somewhat limited from this perspective. Remarkable consistency and agreement was found throughout analysis, member checking and previous studies which adds to the trustworthiness and transferability of our findings. Non-response bias may have occurred as participants may be more proactive, and likely to engage in research. Using the VoIP of Skype was deemed a strength, despite technical difficulties and one corrupted recording. The research team included insider researchers with three practising paramedics and while this may be considered a potential bias, we stated up front the constructivist nature of EGT and how the background of these researchers added to the richness of the EGT. We also made extensive reflective notes, cross-validated coding and analysis and conducted member checking with a very good response rate and heterogeneity in responses.

We were unable to involve patients and public in the study due to the speed of developments. We do, however, plan to disseminate the results to study participants and patient organisations

CONCLUSION

The COVID-19 pandemic is arguable the biggest challenge to have faced providers of healthcare globally. Paramedics are at the forefront of the pandemic response, and this research has revealed rich insights on their experiences, which are consistent with reports in other studies with HCW's in pandemics. We, however, synthesised emergent categories within this study with the work of Calabresi and Bobbitt[23] and developed a new theoretical context which richly articulates the range of issues faced by paramedics through the constructed EGT of 'Tragic Choices in providing paramedic care during the 2020 COVID-19 pandemic'.

Paramedics faced Tragic Personal and professional choices, which included concerns over appropriate PPE, protecting themselves and their relatives, the impact on their mental health and difficult clinical decisions in areas such as EoLC and patients scared to attend hospital. The rapid disruption and adaptation endured may represent significant organisational and professional growth, which has been reported in previous pandemics and following trauma, however accounts in this study may also reflect collective moral injury, which may persist long after the pandemic. Tragic organisational choices were also revealed, around a culture of support in areas such as clinical decision making, EoLC, communication, mental health and well-being, and while somewhat forced, they are influenced by choices made to focus on these areas before, during and after the pandemic. Organisations may choose to explore further reports in our study of why paramedics did not engage in well-being support provided by their employer, the role of

incentives for working overtime in staff who may be fatigued during a pandemic, intrusive media reports which some avoided to protect their mental health, and the positive role of being in nature and exercise. Much of our findings were previously reported in the literature, and therefore when planning for future pandemics organisations can also continue choose to draw on this evidence base (or not).

The relationship between society and paramedics was visibly played out, with public shows of support through social media, the NHS Heroes narrative, clapping and gifts. While appreciative, paramedics told how they were just doing their job, and above all wanted to protect themselves and their families. Paramedics predictions on how they would soon be forgotten about by the public and return to inappropriate use of ambulances and violence and aggression directed towards them, transpired during the pandemic through reports of partying and lack of social distancing VE day celebrations. We argue these issues reflect Calabresi and Bobbitt's notion that what counts as a Tragic Choice is in many ways a matter of public drama, and society may have treated them as tragic, when in fact they need not be. While much of the impact of COVID-19 may be unavoidable, society can choose to limit spread of the disease by observing social distancing for instance. Much of our findings had already been reported in literature from other HCW's in previous pandemics, and while the current response benefited from these insights, warnings were made on the inevitability of such a pandemic and how preparations should focus on issues of PPE, utilisation and resourcing of healthcare, communication and staff well-being. A counter narrative subsequently grew within our study and wider society, around these issues especially in later stages which included healthcare funding and better pay for HCW's.

Paramedic care during the COVID-19 pandemic was provided in the context of a world with competing and conflicting decisions and resources, where a wide range of Tragic Choices have to be made which may challenge the pricelessness of life. It is therefore a disturbing, but undeniable reality that such Tragic Choices have to be made. The impact of COVID-19 may persist if we fail to learn from this and other pandemics and sufficiently resource our healthcare system and provide the prerequisite supportive and safe workplaces, through adequate supply of appropriate PPE, education, and provision of mental health and well-being support. If not, we risk losing more lives in this and future pandemics, paradoxically undermining life's pricelessness and threatening the overwhelming collective effort which united society in hardship when responding to the COVID-19 Pandemic.

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REFERENCES

1. WHO. Coronavirus disease (COVID-19) situation reports, 2020. Available: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports
2. WHO. Coronavirus disease (COVID-19), 2020. Available: https://www.who.int/emergencies/diseases/novel-coronavirus-2019
3. GOV.UK. Number of coronavirus (COVID-19) cases and risk in the UK, 2020a. Available: https://www. gov. uk/guidance/coronavirus-covid-19-information-for-the-public
4. GOV.UK. Coronavirus (COVID-19) action plan, 2020b. Available: https://www.gov.uk/government/publications/coronavirus-action-plan
5. Davies K, Higginson R. Evolution and healthcare impact of a 21st century avian flu pandemic. *Br J Nurs* 2005;14:1066–8.
6. Juszczyk J. [Global strategies in prevention of infectious diseases on the turn of the second and third millennium: expectation versus reality]. *Przegl Epidemiol* 2004;58 Suppl 1:5–9.
7. Thompson AK, Faith K, Gibson JL, *et al*. Pandemic influenza preparedness: an ethical framework to guide decision-making. *BMC Med Ethics* 2006;7:12.
8. Chua SE, Cheung V, Cheung C, *et al*. Psychological effects of the SARS outbreak in Hong Kong on high-risk health care workers. *Can J Psychiatry* 2004;49:391–3.
9. McAlonan GM, Lee AM, Cheung V, *et al*. Immediate and sustained psychological impact of an emerging infectious disease outbreak on health care workers. *Can J Psychiatry* 2007;52:241–7.
10. Chong M-Y, Wang W-C, Hsieh W-C, *et al*. Psychological impact of severe acute respiratory syndrome on health workers in a tertiary hospital. *Br J Psychiatry* 2004;185:127–33.
11. Ho CS, Chee CY, Ho RC. Mental health strategies to combat the psychological impact of COVID-19 beyond paranoia and panic. *Ann Acad Med Singap* 2020;49:1–3.
12. Tiong WW, Koh GCH. Ethical considerations in the review of Singapore's H1N1 pandemic response framework in 2009. *Ann Acad Med Singap* 2013;42:246–50.
13. Hogan C, Williams J, Rees N. Review of the literature concerning Health Care workers' experiences during epidemics and pandemics in relation to the COVID 19 response. *International Journal of Paramedic Practice* 2021.
14. Strauss A, Corbin J. *Basics of qualitative research: techniques and procedures for developing grounded theory*. 2nd ed. Thousand Oaks, CA: Sage, 1998.
15. Charmaz K. *Constructing grounded theory: a practical guide through qualitative analysis*. sage, 2006Jan 13.
16. Guba EG, Lincoln YS. *Paradigmatic Controversies, Contradictions, and Emerging Confluences*. In: Denzin NK, Lincoln YS, eds. *The SAGE Handbook of qualitative research*. Sage Publications Ltd, 2005: 191–215.
17. Strauss A, Corbin J. *Basics of qualitative research*. Sage publications, 1990.
18. Lo Iacono V, Symonds P, Brown DHK. Skype as a tool for qualitative research interviews. *Sociological Research Online* 2016;21:103–17.
19. Glaser B, Strauss AL. *The discovery of Grounded theory*. Chicago: Aldine, 1967.
20. Hra-decisiontools. Is my study research? 2020. Available: http://www.hra-decisiontools.org.uk/research/
21. ESRC. Framework for research ethics, economic and social Research Council; 2010.
22. GOV.UK. Guide to the general data protection regulation, 2018. Available: https://www.gov.uk/government/publications/guide-to-the-general-data-protection-regulation
23. Calabresi G, Bobbitt P. *Tragic choices*. New York: W.W. Norton & Company, 1978.
24. Kohen A, Langdon M, Riches BR. The making of a hero: cultivating empathy, altruism, and heroic imagination. *J Humanist Psychol* 2019;59:617–33.
25. Rankin LE, Eagly AH. Is his heroism hailed and hers hidden? women, men, and the social construction of heroism. *Psychol Women Q* 2008;32:414–22.
26. Franco ZE, Blau K, Zimbardo PG. Heroism: a conceptual analysis and differentiation between heroic action and altruism. *Review of General Psychology* 2011;15:99–113.
27. Tangherlini TR. Heroes and lies: storytelling tactics among paramedics. *Folklore* 2000;111:43–66.
28. Jones-Berry S. COVID-19: nurses receive conflicting advice on PPE and resuscitation, 2020. Available: https://rcni.com/nursing-standard/newsroom/news/covid-19-nurses-receive-conflicting-advice-ppe-and-resuscitation-159701
29. Anderson N, Slark J, Gott M. How are ambulance personnel prepared and supported to withhold or terminate resuscitation and manage patient death in the field? A scoping review. *Australasian Journal of Paramedicine* 2019;16.
30. Pease NJ, Sundararaj JJ, O'Brian E, *et al*. Paramedics and serious illness: communication training. *BMJ Support Palliat Care* 2019. doi:10.1136/bmjspcare-2018-001734. [Epub ahead of print: 15 Nov 2019].
31. Murphy-Jones G, Timmons S. Paramedics' experiences of end-of-life care decision making with regard to nursing home residents: an exploration of influential issues and factors. *Emerg Med J* 2016;33:722–6.
32. Stead S, Datta S, Nicell C. UK ambulance services: collaborating to provide good end-of-life care. *Eur J Palliat Care* 2018;25:112–5.
33. Kirk A, Crompton PW, Knighting K, *et al*. Paramedics and their role in end-of-life care: perceptions and confidence. *Journal of Paramedic Practice* 2017;9:71–9.
34. Brooks S, Amlôt R, Rubin GJ, *et al*. Psychological resilience and post-traumatic growth in disaster-exposed organisations: overview of the literature. *BMJ Mil Health* 2020;166:52–6.
35. Rothes IA, Nogueira IC, Coutinho da Silva AP, *et al*. When emergency patients die by suicide: the experience of prehospital health professionals. *Front Psychol* 2020;11:2036.
36. Spronk B, Stolper M, Widdershoven G. Tragedy in moral case deliberation. *Med Health Care Philos* 2017;20:321–33.
37. Hoffmaster B, Hooker C. Tragic choices and moral compromise: the ethics of allocating kidneys for transplantation. *Milbank Q* 2013;91:528–57.
38. Amerio A, Bianchi D, Santi F, *et al*. Covid-19 pandemic impact on mental health: a web-based cross-sectional survey on a sample of Italian general practitioners. *Acta Biomed* 2020;91:83–8.
39. Wang L, He W, Yu X, *et al*. Coronavirus disease 2019 in elderly patients: characteristics and prognostic factors based on 4-week follow-up. *J Infect* 2020;80:639–45.
40. Li P, Chen L, Liu Z, *et al*. Clinical features and short-term outcomes of elderly patients with COVID-19. *International Journal of Infectious Diseases* 2020;97:245–50.
41. Straus SE, Wilson K, Rambaldini G, *et al*. Severe acute respiratory syndrome and its impact on professionalism: qualitative study of physicians' behaviour during an emerging healthcare crisis. *BMJ* 2004;329:83.
42. Chao D. Time to show unity against SARS. *BMJ* 2003;326:938.
43. Ives J, Greenfield S, Parry JM, *et al*. Healthcare workers' attitudes to working during pandemic influenza: a qualitative study. *BMC Public Health* 2009;9:1–3.

44 Civaner MM, Vatansever K, Pala K. Ethical problems in an era where disasters have become a part of daily life: a qualitative study of healthcare workers in turkey. *PLoS One* 2017;12:e0174162.

45 Litz BT, Stein N, Delaney E, *et al*. Moral injury and moral repair in war veterans: a preliminary model and intervention strategy. *Clin Psychol Rev* 2009;29:695–706.

46 Anderson L. My working week: 'If I take a patient to hospital, it could save them. But it might kill them', 2021The Guardian. Available: https://www.theguardian.com/society/2020/may/25/my-working-week-take-patient-hospital-save-kill-paramedic-covid19

47 Greenberg N, Docherty M, Gnanapragasam S, *et al*. Managing mental health challenges faced by healthcare workers during covid-19 pandemic. *BMJ* 2020;368:m1211.

48 Howell AJ, Passmore HA. The nature of happiness: Nature affiliation and mental well-being. In: *Mental well-being*. Dordrecht: Springer, 2013: pp231–57.

49 Russell R, Guerry AD, Balvanera P, *et al*. Humans and nature: how knowing and experiencing nature affect well-being. *Annu Rev Environ Resour* 2013;38:473–502.

50 Gritzka S, MacIntyre TE, Dörfel D, *et al*. The effects of workplace nature-based interventions on the mental health and well-being of employees: a systematic review. *Front Psychiatry* 2020;11:323.

51 Brymer E, Freeman E, Richardson M. Editorial: one health: the well-being impacts of Human-Nature relationships. *Front Psychol* 2019;10:1611.

52 Mora Cortez R, Johnston WJ. The coronavirus crisis in B2B settings: crisis uniqueness and managerial implications based on social exchange theory. *Industrial Marketing Management* 2020;88:125–35.

53 Kabadayi S, O'Connor GE, Tuzovic S. Viewpoint: the impact of coronavirus on service ecosystems as service mega-disruptions. *Journal of Services Marketing* 2020;34:809–17.

54 Heinonen K, Strandvik T. Reframing service innovation: COVID-19 as a catalyst for imposed service innovation. *Journal of Service Management* 2020;32:101–12.

55 Ho CS, Chee CY, Ho RC, *et al*. Mental health strategies to combat the psychological impact of COVID-19 beyond paranoia and panic. *Ann Acad Med Singap* 2020;49:1–3.

56 Seale H, Leask J, Po K, *et al*. "Will they just pack up and leave?" - attitudes and intended behaviour of hospital health care workers during an influenza pandemic. *BMC Health Serv Res* 2009;9:30.

57 Poon E, Liu KS, Cheong DL, *et al*. Impact of severe respiratory syndrome on anxiety levels of front-line health care workers. *Hong Kong Med J* 2004;10:325–30.

58 WAST. Reach for razor campaign, 2020. Available: Vaihttps://m.facebook.com/welshambulanceservice/videos/reachfortherazor-jason-killens-chief-executive/510213319916197/ [Accessed on 02/01/2020].

59 Gunnell D, Appleby L, Arensman E, *et al*. Suicide risk and prevention during the COVID-19 pandemic. *Lancet Psychiatry* 2020;7:468–71.

60 Lai CC, Shih TP, WC K. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and corona virus disease-2019 (COVID-19): the epidemic and the challenges. *Int J Antimicrob Agents* 2020;17:105924.

61 Rossi R, Socci V, Pacitti F, *et al*. Mental health outcomes among frontline and second-line health care workers during the coronavirus disease 2019 (COVID-19) pandemic in Italy. *JAMA Netw Open* 2020;3:e2010185.

62 Kisely S, Warren N, McMahon L, *et al*. Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: rapid review and meta-analysis. *BMJ* 2020;369:m1642.

63 Rose SC, Bisson J, Churchill R, *et al*. Psychological Debriefing for preventing post traumatic stress disorder (PTSD). *Cochrane Database Syst Rev* 2002;171.

64 NICE. Evidence: post-traumatic stress disorder guidance, 2018. Available: https://www.nice.org.uk/guidance/ng116/evidence/

65 Holmes EA, O'Connor RC, Perry VH, *et al*. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *Lancet Psychiatry* 2020;7:547–60.

66 Kleppa E, Sanne B, Tell GS. Working overtime is associated with anxiety and depression: the Hordaland health study. *J Occup Environ Med* 2008;50:658–66.

67 Kok BC, Herrell RK, Grossman SH, *et al*. Prevalence of professional burnout among military mental health service providers. *Psychiatr Serv* 2016;67:137–40.

68 Wong K, Chan AHS, Ngan SC. The effect of long working hours and overtime on occupational health: a meta-analysis of evidence from 1998 to 2018. *Int J Environ Res Public Health* 2019;16:2102.

69 Billings J, Ching BCF, Gkofa1, V. Healthcare workers' experiences of working on the frontline and views about support during COVID-19

70 Eftekhar Ardebili M, Naserbakht M, Bernstein C, *et al*. Healthcare providers experience of working during the COVID-19 pandemic: a qualitative study. *Am J Infect Control* 2021;49:547–54.

71 British Medical Association. BMA survey finds doctors' lives still at risk despite PPE pledges. The British Medical association is the trade Union and professional body for doctors in the UK., 2021. Available: https://www.bma.org.uk/bma-media-centre/bma-survey-finds-doctors-lives-still-at-risk-despite-government-pledges-on-ppe

72 Horton R. Offline: COVID-19 and the NHS-"a national scandal". *Lancet* 2020;395:1022.

73 Bradsher K, Alderman L. The world needs masks. China makes them—but has been hoarding them New York Times; 2020: 13.

74 Scally G, Jacobson B, Abbasi K. The UK's public health response to covid-19 2020.

75 Nuki P, Gardner B. Exercise Cygnus uncovered: the pandemic warnings buried by the the government. The telegraph, 2020. Available: https://www.telegraph.co.uk/news/2020/03/28/exercise-cygnus-uncovered-pandemic-warnings-buried-government/ [Accessed 14 Dec 2020].

76 Morris J. What has been the impact of Covid-19 on urgent and emergency care across England, 2020a. Available: https://www.nuffieldtrust. org. uk/news-item/what--has-been-the-impact-of-covid-19-on-urgent-and-emergency-care-across-england

77 Moore Alison. Ambulance response fastest ever as demand wanes. Health Service Journal, 2020. Available: https://www.hsj.co.uk/quality-and-performance/ambulance-response-fastest-ever-as-demand-wanes/7027641.article?fbclid=IwAR2HdJKop7MtrDNIgpTo1WZ2Fr9aUdfLyTc_jzOEu3q%20Q65sJM9WxcsR50s [Accessed 29 Oct 2020].

78 GOV.WALES. WG (2020) record high demand on ambulance and emergency departments during challenging December, 2020. Available: https://gov.wales/record-high-demand-ambulance-and-emergency-departments-during-challenging-december

79 Welsh Ambulance Service NHS Trust. The performance report, 2018. Available: https://www.ambulance.wales.nhs.uk/assets/documents/7d0c97f9-b562-4f95-9af6-2200c642e3b7636670743715317704.pdf

80 Hope C, Dixon H. The story behind 'Stay Home, Protect the NHS, Save Lives'—The slogan that was 'too successful' The Telegraph; 2020.

81 Wong LE, Hawkins JE, Langness S. Where are all the patients? addressing Covid-19 fear to encourage sick patients to seek emergency care. New Englan Journal of medicine. *May* 2020;2020.

82 BBC News. Coronavirus: NHS staff fear second wave after ve day parties, 2021. Available: https://www.bbc.co.uk/news/uk-wales-52608132?at_campaign=64&

83 ONeill R. Senior doctors fear coronavirus second wave after drunken ve day parties, 2020. Available: https://www.walesonline.co.uk/news/wales-news/doctor-street-parties-lockdown-coronavirus-18228839

84 Manning A. How will Covid-19 shape the future economic role of the British state? *LSE Business Review* 2020.

85 the Guardian. Give NHS workers a pay rise as well as a clap, 2020. Available: https://www.theguardian.com/society/2020/apr/27/give-nhs-staff-a-pay-rise-not-just-a-clap

86 Qunomedical. OECD healthcare salary index by Qunomedical, 2020. Available: https://www.qunomedical.com/en/research/healthcare-salary-index/

87 Clark LV, Fida R, Skinner J, *et al*. Mental health, well-being and support interventions for UK ambulance services staff: an evidence map, 2000 to 2020. *Br Paramed J* 2021;5:25–39.

88 Berger D. Up the line to death: covid-19 has revealed a mortal betrayal of the world's healthcare workers. *BMJ* 2021;29.

89 Mohammed S, Peter E, Killackey T, *et al*. The "nurse as hero" discourse in the COVID-19 pandemic: A poststructural discourse analysis. *Int J Nurs Stud* 2021;117:103887.

90 Booth R, Butler P, Campbell D, Guardian Newspaper. NHS, social care and most vulnerable 'betrayed' by Sunak's budget, 2021. Available: https://www.theguardian.com/uk-news/2021/mar/03/nhs-social-care-and-most-vulnerable-betrayed-by-sunaks-budget [Accessed 3 Mar 2021].

91 Dowd A. Covid-19: budget has failed to provide recovery funding for NHS, health leaders warn. *BMJ* 2021;2021:n633.

92 HM Treasury. Budget (2021) protecting the jobs and livelihoods of the British people. Available: https://www.gov.uk/government/publications/budget-2021-documents [Accessed 4 Mar 2021].

93 #NHS Pay (2021) NHS Pay Twitter Hashtag. Available: https://twitter.com/hashtag/nhspayrise?lang=en [Accessed 28 Mar 2021].