

A Biopsychosocial Framework for Recovery from COVID-19

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Abstract

This paper proposes a biopsychosocial analysis of Covid-19 experiences enhances understanding of complex and interrelated factors and leads to the proposition of a biopsychosocial recovery framework.

Online narrative research was used to explore people's experiences of Covid-19 was conducted over a four-month period. The call was distributed via a short open ended qualitative online survey advertised on social media platforms and 305 responses came from across England.

The findings illustrate people with a narrow range of biopsychosocial characteristics experienced a wide range of biopsychosocial impacts which are nuanced, complex and dynamic. Left unaddressed these may create future adverse biopsychosocial characteristics. An integrated biopsychosocial framework for recovery is proposed to avoid such further negative outcomes from the pandemic.

The sample contained a bias in age, gender and living arrangements.

The paper offers a clear framework to enable integrated holistic recovery / re-growth planning.

The paper is original in its use of a biopsychosocial analytical framework.

Introduction

The COVID-19 pandemic has challenged clinical and health care services globally. Given the high infection rate, rapid transmission, and the documented risks (irrespective of prior health status), prolonged periods of recovery and morbidity are expected in groups across the world. The development of clinical management strategies to ensure effective responses to COVID-19 and to better understand the lasting impacts is ongoing. Considerable attention and resource have been provided to allow emergency care protocols to establish antibody tests, vaccines and testing protocols and to better understand the long-term care and rehabilitative protocols that are needed to support those with prolonged morbidity. Whilst establishing control measures, safe clinical working practices, treatment protocols, tests and vaccines, which are of prime importance, other concerns have been given substantially less consideration. Examples of this are the wide range of psychological and social impacts, that have not been prioritised, compared to the clinical and biological counterparts.

Alongside the development of the biological terrain (Boseley, 2020), attention is directed towards preventing economic collapse through a structured and phased return to restore business operation. Economic recovery is also contingent on wellbeing "feeling good and functioning well" (Aked *et al.* 2008, p.4). Consequently, the UK economy is dependent on people having sufficient wellbeing to be able to work and shop as it is on workplaces and

shops being open. However, a significant issue is the pandemic legacy and its control measures, which may create long-term issues in terms of both physical and mental health in the 'new normal' (the adapted day-to-day life for individuals in society since the onset of COVID-19). Economic development has been importantly considered, with the UK Government offering the furlough scheme (Coronavirus Job Retention Scheme, 2020), the Eat Out to Help Out Scheme and other initiatives to stimulate economic activity. Education, in the social domain, is restarting although under review as the transmission risk is weighed against the risk of poor educational attainment. However, whilst wider needs are being considered in emergent 'recovery' plans across services, we are concerned these do not take adequate account of the psychological and social impacts of COVID-19 and how these interact. A 'one size fits all' recovery plan has the potential to fail, with dire consequences, due to many facets that need to be considered for applicability and suitability. As Assi *et al.* (2020, p.110) state; 'this medical model of disease risks ignoring social factors, which can increase exposure to and mortality from' COVID-19.

Researchers from the Centre for Research in Health and Society at the University of Cumbria and the Human Science Research Centre at the University of Derby conducted national, exploratory, narrative research, to understand how the pandemic was affecting people's lives; this paper reports findings from the research and is based on the first 305 narratives received.

Our analysis uses a biopsychosocial (BPS) theoretical framework (Bolton and Gillet, 2019; Engels, 1977; Marmot, 2005; Wade and Halligan, 2017) to enable understanding of psychological and social impacts alongside biological impacts. Broadly speaking, the BPS framework is grounded in complexity theory and general systems theory. The underpinning assumption is that a hierarchy of individual and interlinked systems affect health and wellbeing. In proposing the BPS model, Engels (1977) was responding to three main problems in medical thinking which he believed caused dehumanizing care: (1) the dualistic nature of the medical model, with its separation of body and mind; (2) the materialistic and reductionistic orientation of medical thinking; and (3) the influence of the observer on the observed. Consequently, the BPS model adopts a 'broad definition' of the object of medical work in terms of an illness that is concerned with the lifeworld of the patient. This directs clinical attention to all domains of human life, as the boundaries between health and illness, between well(ness) and sick(ness), are diffused by cultural, social, and psychological considerations (Farre and Rapley, 2017). As Engels (1960 p.132) stated:

'The existing biomedical model does not suffice. To provide a basis for understanding the determinants of disease and arriving at rational treatments and patterns of health care, a medical model must also take into account the patient, the social context in which he [sic] lives, and the complementary system devised by society to deal with

the disruptive effects of illness, that is, the physician role and the health care system. This requires a biopsychosocial model’.

The BPS model has been variably implemented as a philosophy, an approach and a practice in health education, health psychology, public health and preventive medicine (Alonso, 2004). Also in dementia, ageing and pain (Gagliese *et al.*, 2018), as well as in healthcare (e.g. cardiology and oncology) adolescent health (Farre and Rapley, 2017) and psychotherapy (Gilbert, 2019).

Five critiques have been levelled against the BPS approach. Methodologically, some focus on the apparent lack in empirical evidence (Alvarez *et al.*, 2012), agreed criteria to measure each factor, and ‘testability’ (Farre and Rapley, 2017). Practically, some highlight the difficulty of implementing BPS in clinical practice (Alvarez *et al.*, 2012; Benning, 2015), particularly as it is so general (Farre and Rapley, 2017). Culturally BPS is criticised for failing to take account of subjectivity in constructs of the psychological and social factors (Benning, 2015). Theoretical criticisms focus on its lack of adherence to complexity theory (from where it originated) and failing to acknowledge that not all factors will be identified (Benning, 2015 p.315). Kontos (2011 p.509) argues that clinicians are over-enthusiastic in adopting and clinging to the BPS ‘straw man’, believing this is untenable as there is not a single model that can solve the ails of the medical system. However, many of these criticisms were overcome by the evidence-based, patient-centred interview protocols of Smith *et al.* (2013). This is because they were data-driven, controllable practical and place communication and complexity at the heart of all clinical interactions (Farre and Rapley, 2017).

Moreover, the BPS model has previously been found useful in guiding the comprehension of pandemics and in reduction planning. For example, Flowers *et al.* (2016 p.759) adopted a BPS approach to understanding pandemic behaviour in an influenza context; highlighting psychosocial determinants of behaviour (e.g. agency, cognitions and identity) and sociocultural determinants (e.g. social context and capacity). Their findings led to proposals for public health interventions.

A literature review was undertaken to determine the use of BPS in studies of COVID-19. Databases (One Search, CINAHL, MEDLINE, SocINDEX, SciVerse, SCIENCE Direct, PsycArticles and Google Scholar) were searched using the terms ‘Coronavirus Disease’ OR Coronavirus, OR COVID-19, together with ‘biological, OR physical OR wellbeing’ AND ‘psychological OR mental health OR wellbeing’ AND ‘social OR distance OR isolation’. The search returned 80 articles (full review available on request). Some papers identified BPS issues individually: biological (n=1), psychological (n=7) and social (n=7); several combined two categories: psychosocial (n=11), biopsychosocial (n=8) or biosocial (n=5); and others evidenced biopsychosocial factors but without reference to a BPS framework (n=13). Furthermore, several studies used a BPS approach, including Qi *et al.* (2020) who explored causes of morbidity and chronic fatigue in

COVID-19 patients; Sung-Wan and Kuan-Pin (2020) who considered the impact of COVID-19 on incarcerated people; Ye (2020) who considered the impact on children's wellbeing; and Griffith *et al.* (2020) who mapped sex differences in COVID-19 mortality rates. Griffith *et al.* (2020, p.9) forward a strong argument for the value of BPS in COVID-19 research, stating:

'A biopsychosocial approach takes into account not only the range of factors that determine risk but also the range of places where we might intervene within a population health framework that considers both biomedical and public health points of intervention to reduce mortality from COVID-19'.

The rationale of Griffith *et al.* (2020) guides our use of BPS as a theoretical framework in this research. We seek to understand the impact of COVID-19 and its control measures biologically, psychologically and sociologically to inform biopsychosocial intervention development to holistically reduce the contagion and mortality rates of COVID-19 short term and improve wellbeing for the long term. We argue the pandemic is reinforcing existing needs and creating new ones that are complex and dynamic. The biopsychosocial framework makes the range of needs and their interaction visible. As such, our final proposal is for an equitable and nuanced biopsychosocial recovery framework, implementable within communities, organisations and public services to ensure parity across society concerning recovery.

Method

The project aimed to elucidate understanding of the scale and nature of the impact of Covid-19 on people's lives. The outcomes of the research were to understand the participants' biopsychosocial characteristics and recovery needs. Working within a mixed methods paradigm (Brannen, 2005) our research design was informed by the explanatory aims of the research. As such, mixed methods research was used because it is well established as adding conceptual clarity and coherence to key areas of knowledge (Niglas, 2000). The mixture of qualitative and quantitative data increases the richness and robustness of the findings (Tashakkori and Teddie, 1998).

Participants were sought through a range of networks and social media platforms hence there was no specific inclusion criteria. They were asked to share their personal experiences via three broad questions:

- 1) What was your life like before the pandemic?
- 2) What was the impact of the pandemic on your life?
- 3) What support do you need to recover?

Open-ended questions enabled flexibility for the participants to determine the length and depth of the answers they wanted to provide. Consequently, submissions varied from a few sentences to 500-word extracts. Data collection began on March 15th, 2020 and by June 29th, 2020, 305 participants had responded.

The ethical considerations took into account of institutional guidance and relevant social media research guidance (Social Media Research Group, 2016). Ethical permission was granted by the University of Cumbria Ethics Committee. Participant consent was secured via the JISC Online Survey participant information and consent section. All narratives were anonymised for analysis with email addresses securely stored on an encrypted device to ensure withdrawal was possible and any safeguarding concerns followed up or referred on to relevant professionals.

The data was abductively analysed (Tavory and Timmermans, 2014) using a pre-existing biopsychosocial framework which was iteratively developed. First, data were coded into biological, psychological or social categories. Second, coding moved from simple categorization to thematic and analytical, with new codes being developed to capture the richness of the data. Last, the frequency of each theme was counted to ‘quantise’ the narratives (Wojatzki *et al.*, 2018). Our findings section reports descriptive statistics and quotes together to provide a sense of scale and nature of the issues reported, thus strengthening the analysis through combining both qualitative and quantitative data (Schoonenboom and Johnson, 2017).

Sample demographics

Participants described who they were in their narratives. Some disclosed personal details others did not, and what was disclosed varied. The demographic characteristics are therefore indicative rather than absolute descriptors of the sample as shown in Table i.

Table i. Demographics revealed by respondents (NB: totals exceed 305 where respondents provided more than one answer)

Demographic	Variable	Frequency	Percentage
Age (305 respondents, 100%)	Under 16	1	0.3%
	17 to 25	20	7%
	26 – 45	89	29%
	46 – 65	157	51%
	66-85	38	12%
Gender (293 respondents, 96%)	Female	231	79%
	Male	60	20%
	Other	2	1%
Ethnicity (0 respondents)	None disclosed		
Pre-existing health issue		189	62%

Pre-existing mental wellbeing issue		72	24%
Relationship status (292 respondents, 96%)	Married	128	44%
	Partner	88	30%
	Single	48	16%
	Other	28	10%
Employment status (305 respondents, 100%)	Working at home	73	24%
	Working - keyworker	30	10%
	Unemployed	65	21%
	Furloughed	24	7%
	Volunteer	37	12%
	Retired	30	10%
	Other	52	16%
Housing status (264 respondents, 87%)	Detached house	64	24%
	Semi-detached house	74	28%
	Terraced house	50	19%
	Flat	22	8%
	Bungalow	16	6%
	Cottage	6	2%
	Farm	3	1%
	Other (barge, studio, bedroom, park home)	15	6%
Area (99 responses, %)	Rural	52	53%
	Urban	34	34%
	Suburban	8	8%
	Coastal	5	5%
Garden space (132 responses, 32%)	Garden	121	92%
	Allotment	4	3%
	Patio	1	1%
	No garden	6	4%
Hobbies (305 responses, 100%)		453	100%
Sports (222 responses, 73%)		222	73%
Religion (4 responses, 1%)		4	1%
UK Area (102 responses, 33%)	Scotland	1	0.9%
	North England	55	54%
	Wales	10	9%
	Central England	10	9%
	London	4	4%
	South England	22	22%

The participants were primarily female (n=231), aged 45-65 years old (n=157), with pre-existing health conditions (n=189) and lived with a partner or spouse (n=216), in a house (213) with a garden (121), located in Northern England (55); most reported participating in hobbies and sports. No participant disclosed their ethnicity which may suggest being predominantly White British.

Several factors might explain this self-selected sample bias. The age range may be due to these individuals having the time and interest to respond to such research. The social trends may be indicative of a group of people who are relatively well-insulated from the effects of the pandemic enabling their capacity to respond. The gender bias may correlate to a wider gender bias in health research, for example, a review of 259 nursing studies found that on average, 75.3% of research study respondents were female (Polit and Beck, 2008). Whilst speculative, having a health issue may have been a motivation to respond with participants having vested interests in recovery planning. The University of Cumbria's location and networks who circulated the survey to their members may have influenced the Northern England bias. The ethnicity bias might correlate to a wider under-representation of BAME in research (Redwood and Gill, 2013) and is particularly pertinent as individuals from a BAME background are at greater risk of COVID-19 than non-BAME (Kirby, 2020).

Notwithstanding, the sample bias suggests the findings will very generally show the impact of COVID-19 on mature people, with social support, space, occupation and a relatively high socioeconomic status. As such, the findings present a story from a position of relative advantage, providing insights (if not information), into the impact that might be experienced by those from low education and socioeconomic status (Stuart *et al.*, 2019).

Findings

Biological Impacts

The direct impact of COVID-19 on respondents' lives was tangible but not severe. Only two of the 305 respondents reported having contracted COVID-19, 115 had shown symptoms, 136 knew someone who had contracted COVID-19, and three knew someone who had died following a COVID-19 infection. Furthermore, only five respondents mentioned having gone through a period of quarantine, and 37 reported 'shielding'; either as individuals, families or with partners who were 'shielding'. Additionally, 20 people reported living separately within the same household to protect family members from their keyworker exposure to COVID-19.

Of the 189 respondents with a pre-existing health issue, 42 reported their condition had worsened. Examples included a respondent with diabetes whose "blood sugar levels [had] become erratic" (P.6), and another with irritable bowel syndrome whose "tummy is telling me I'm more anxious than usual!" (P.8). Three people disclosed that treatments or operations had been delayed, which might also impact their health adversely, for example:

“I have regular injections... These have been suspended for three months. This will compromise my immune system and make me more vulnerable to catching the virus” (P.21).

“[I’ve] been suffering with shortness of breath and pain for 6 weeks now, I need a lung function test and CT scan, but it was cancelled just as the virus took hold” (P.30).

Some participants (n=35) commented on changes in their health choices and lifestyle. The most frequent was eating more (n=10), perhaps driven by extended periods at home “I am overeating more due to having time to cook and bake” (P.129), although four people mentioned having more time to cook healthily. No one mentioned eating less. Furthermore, ten reported exercising less, whilst six mentioned exercising more due to being furloughed. For some, diet and exercise factors compounded: “I’m snacking more and exercising less” (P.256).

Moreover, respondents experienced a range of biological impacts due to COVID-19 control measures; these were unevenly distributed across the sample. For those with pre-existing health conditions, or caring for/living with someone who did, the biological impacts were immediate; exacerbating illnesses when access to healthcare was restricted. Such biological impacts interacted with the psychological domain.

Psychological Impacts

Eight states of mental wellbeing were reported; six negative and two comparatively positive. Generalised anxiety was the most frequently mentioned state of negative mental wellbeing (n=84), followed by stress (n=51), depression (n=33), and general poorer mental wellbeing (n=18), although some experienced a combination. For example, one respondent reported “Increased stress, anxiety and depression. Huge feelings of uncertainty and some fear” (P.3); another had “waves of anxiety [and] stress [and] worry for the future, personally for self [and] family, [and] for my business [and] employees” (P.271); whilst a third experienced “lower mood and feelings of worthlessness” (P.301). Further, eight people reported that the pandemic had prompted, or worsened, panic attacks and new obsessive-compulsive disorders were mentioned by 16 people - although, given government guidance to prevent transmission, distinguishing between appropriate or obsessive hand washing and sanitation is difficult.

Several reasons were given for the increased stress and anxiety experienced. Managing the anxiety of another family member was most frequently mentioned (n=11); such anxiety was created by partners losing jobs or being furloughed; trying to support bereaved relatives; concerns over children’s exam results, lost learning, and “going back to school” (P.285); as well as concern for elderly parents: “Stress is coming in a number of ways, mainly my elderly Mum” (P.9).

Family tensions were also a stressor, with references to poor relationships being overstretched during lockdown (n=8), for example: “My marriage was already a little rocky and this is just thrusting our issues to the forefront” (P.124). Other stressors were health-oriented, relating to access to prescriptions (n=4), and medical appointments being cancelled (n=4). Further stressors were financial: “stressed about money, jobs” (P.285).

Contrastingly, 15 people reported no mental health variances and 31 people said they experienced less stress due to being furloughed: “enjoying being in my home more” (P.15); or having increased family support: “Less stress than normal as partner at home” (P.52).

Notwithstanding, 342 emotional pandemic responses were apparent within respondents’ narratives (more than one per respondent); of these 281 were negative. A total of 25 emotions were reported; 23 were negative.

The most frequently cited emotion was worry (n=59), with 338 occurrences (equating to an average of six causes of worry per respondent), and 29 different causes of worry indicated. Respondents worried most about contracting COVID-19 (n=42), followed by how long the pandemic would last (n=33); keyworkers (n=30); parents contracting COVID-19 (n=27); the impact on young people (n=18); the new normal (n=17); and the impact on personal finances (n=16) (others n=155). Once again, however, people worried about things in combination:

“[I am] worrying about family, but also about the kind of society we’ll return to (high unemployment, inequality, recession etc.)” (P.157);

“...worried about my family who have a history of COPD and those who are still working in the care industry” (P.88)

“I still worry about others who are stuck in flats or houses with no garden, and for the young people who aren’t able to socialise” (P.217)

Loneliness was reported by 24 people living alone; for most (n=19) loneliness was a negative experience, making them “Feel very isolated and vulnerable” (P.189). Only five people mentioned feeling happy in their own company: “I enjoy my own company and like peace and quiet, so I am enjoying being locked down” (P.295)

Psychological impacts resulting from alterations to social life during lockdown were commented upon by 80 people. Guilt from being unable to support struggling family members was the most prevalent theme (n=24), for example: “I am a carer for my 86 year old mother- she lives alone and is reasonably independent but has poor mobility - the fact that I am unable to visit her every day, has caused me some anxiety” (P.191). Home and family life becoming more intense during lockdown was mentioned by 21 people. Other themes related to negative impacts from not leaving the house (n=14), intimate and familial relationships being adversely affected (n=11), for example:

“My best friend’s mum died in hospital of coronavirus...Her funeral was the next day, I was not allowed to go, I cannot hold my friend and cook her food, or walk alongside with her as she buried her mum” (P.30)

“...being at home with my wife and daughter all the time has been trying at times” (P.192).

Alternatively, the second most frequently mentioned emotional state was acceptance (n=35): “We are simply accepting that this is a situation that we find ourselves” (P.235); “we have all settled into a new way of life” (P.217). The most cited positive emotive state was happiness (n=24); caused by a range of factors including increased time at home, increased exercise, less work stress and more time with a partner:

“My husband...is now working from home...nice to have him around...lunchtime and for a cup of tea in the morning. He also seems to have more energy; I think the commute was quite tiring” (P.201).

Self-efficacy is a person’s ability to control and manage their own lives to achieve what they want. There were 103 references to changes in self-efficacy, mostly negative. Most references were lost motivation (n=27), although people also reported feeling powerless (n=13), losing their purpose (n=12), losing productivity (n=9), and experiencing poorer mental focus through reduced concentration and capacity (n=10). These would all erode the ability to work, support family, home educate, and to make healthy choices. In contrast, 31 people indicated improved self-efficacy evidenced through achieving more around the house: “catching up on housework/decoration” (P.129); “enjoying completing DIY jobs and gardening” (P.40), and being more creative with increased leisure time (n=12): “learning new skills such as how to preserve and ferment food from my garden” (P.67)

A total of 295 people referred to maintaining their mental wellbeing; 17 support strategies were identified. The most frequently mentioned was finding personal space (n=42) followed by acceptance (n=35), for example: “We try to keep to a routine in which we do jobs and activity stuff in the morning, usually together, then have our own space in the afternoon” (P.94). Contact with family (n=31) and avoiding social media (n=22) also appeared to maintain mental wellbeing. Notwithstanding, 36 people were unable to utilise their normal support strategies; in part due to lockdown restrictions delimiting access to social support, hobbies and sports; but also through enduring long periods in a restricted space.

The psychological impacts of COVID-19 reported were wide-ranging and experienced, overall, by most people regardless of other characteristics. They included deteriorations in overall mental wellbeing, negative emotions, extensive worry and stress, loneliness, and reduced self-efficacy, all of which are acutely significant for the individual. Social supports are

important in times of psychological distress but social access was also delimited during the lockdown. The impacts are discussed below:

Social Impacts

Respondents to the survey undoubtedly missed their normal lives; there were 399 references to 'missing things', across a range of 19 items. These were mostly oriented around people; the most frequent being family (n=56) and friends (n=55): "Being isolated from friends, family and colleagues has been the hardest thing for me" (P.278). Teachers and lecturers missed contact with pupils and students (n=30): "I miss the kids and the team and learning online is rubbish" (P.35). Others specifically missed 'social contact' (n=27): "I do miss our freedom, social contacts and usual routines" (P.250).

The next most missed activity was sports (n=43): "I usually swim a couple of times a week to help manage my stress levels...I'm really missing that!" (P.203), followed by hobbies (n=32): "Sad to have lost all those things I carefully put into place to carry me through living alone, like art classes and walking with a rambling group" (P.253).

People were finding new ways to navigate social life with digital media increasingly important. Many people (n=117) referred to positive life changes, the most prevalent was accessing family via online platforms (n=57): "I am in daily FaceTime contact with my parents and my in-laws as they are all elderly and are completely isolated at home" (P.7). Others (n=19) mentioned using online platforms for social activities, exercise and networks: "...we meet socially via Zoom. Pilates session run via Zoom quite successfully and various committees via Zoom/Skype. Weekly family quiz via Zoom" (P.208).

Supporting others in new ways was recounted (n=106); this was often referred to in practical terms, particularly regarding shopping and picking up prescriptions: "I am shopping for our household plus two others" (P.8). Caring was more permanent for those looking after elderly parents (n=18) or children with needs (n=15); the pressure of balancing these responsibilities was apparent: "Being forced to work while caring for a disabled child is impossible" (P.30); "Our son is no longer able to go to his specialist school and this is isolating for him. He struggles with the lack of routine and we struggle with the lack of respite" (P.114).

Some respondents commented that children and teens generally needed more support (aside from education) as they struggled with lockdown (n=13). Young respondents were worried about missing exams (n=9), university students worried about learning online (n=6) or losing access to laboratories for PhD research (n=6). Changes had occurred in many educational settings. Nurseries and childcare closed alongside schools, colleges and universities. Such educational impacts were mentioned by 105 respondents; 42 said they were home-schooling children and whilst some (n=8) thought it a positive, others (n=23) identified increased stress. Notwithstanding, the balancing of responsibilities was again apparent:

“I am a university student in my second year of my degree...I have two young children needing education...exhausted and struggling...submitting work I could have done a lot better” (P.90);

Most respondents commented on changes in employment (n=295). Whilst only nine respondents had lost their employment, 40 had been furloughed, 18 had experienced changes to working hours, and 5 were redeployed. The nature of work was also changing, sometimes in terms of responsibilities (n=25), but also in other respects such as diminished work-life balance (n=39): “The difference between work and personal time has blurred into one” (P.265); and increased workload pressure (n=29). Moreover, benefits from less commuting (n=16) were tempered by the strain of increased digital meetings (n=14): “I am working at home but needing to work long hours with back to back meetings with no breaks” (P.15). Only four people felt their work-life balance had improved whilst six believed their workload had decreased. Additionally, some people reported feeling unsafe at work due to exposure to COVID-19 (n=4) or due to a lack of PPE (n=5).

Financial issues were commented upon by 61 respondents, these included being generally worse off (n=21), but also included concerns about lost share values (n=17); pay cuts (n=6): “We have taken a 20% pay cut to secure staff wage” (P.250); and pension decreases (n=2): “my husband’s pension investment has plummeted” (P.193).

Generally, the social impact of COVID-19 was negative, respondents highlighted a wide range of negative social impacts. These findings illustrate the interrelatedness of the biological, psychological and social domains, each impacting the other; the psychological strain from coping with the ‘new normal’ is clear.

Support Needs

A total of 389 references were made to support needs, an average of 1.3 per person. The most frequently cited was social support (n=287), followed by biological (n=49); psychological support was the least frequently cited (n=24). A small number (n=29) reported having no support needs.

In terms of social support, respondents indicated a range of needs. The most prevalent was educational and social care support for children (n=53). Employment-related support was also mentioned, including support to remain in, or find new work (n=52); support to get back to work (n=27), either in resettling into a routine, or to feel safe in the workplace, and support for self-employed people (n=15). Two people highlighted the need for legal advice as they navigated the new policy terrain and their rights within it: “Legal advice Re. work, I’ve asked our union and he just said no-one will be furloughed, blanket policy. So, I’m probably going to end up sick” (P.30)

The third most mentioned was support 'to readjust priorities' (n=44). This reflected people's sense that health, wellbeing, family, and the environment, should be a higher priority than economic growth and materialism: "People have been given the opportunity to recognise what actually is important in life" (P.116); "we need to be far less materialistic in every way" (P.186). How this would be achieved was unclear.

The need for financial aid was mentioned by 37 people, reflecting the financial impacts of lockdown on some respondents, for example: "Financial support for my partner would be good as I am currently supporting both of us on a part time salary" (P.97), "Financial support to pay off debts" (P.6); "Financial support would be good as we have spent a lot of money on making sure we had plenty of food in" (P.192).

Biological support needs included five items. Those with underlying health issues highlighted continued support with food shopping (n=12) and support for shielding (n=9): "We are shielding and totally reliant on neighbours to shop etc." (P.51). Support for elderly relatives to continue to live at home was cited by 14 people; this is perhaps due to the high mortality rates in care homes and perceived risk of infection in hospitals: "We have hesitated to hospitalise him for treatment and have tried to manage his conditions at home" (P.278). Three people required routine treatments and appointments reinstating to meet on-going health needs: "Some medical help as I normally see a podiatrist every 2 months so my feet are in danger of getting worse if the clinics are closed for very much longer" (P.257). Eleven people mentioned the need for a vaccine as the only sure way to end pandemic control measures and to ease public fear: "I'm unlikely to be able to do much until a safe and tested vaccine is available" (P.266).

Despite 72 respondents indicating a pre-existing mental wellbeing issue, and the high range of mental wellbeing impacts reported, only 24 people stated they wanted psychological support. Two forms of psychological support were mentioned, most frequent being mental health support (n=20) including access to professional and holistic therapies. Second was psychological support to feel safe (n=4): "to feel less anxious about going out and mixing with people again" (P.270).

Moreover, respondents highlighted a range of support needs, whilst these spanned the biological, psychological and social domains, the intertwined nature of their needs was, again, apparent.

Discussion

This research has shown that the COVID-19 pandemic is having an extensive impact in additional areas, other than the biological and clinical. Also, the research has illustrated that attention to biopsychosocial categories highlight the different and dynamic nature of needs which, if left unaddressed, will create further long-term issues. This leads us to propose a biopsychosocial recovery framework to ensure all needs are addressed.

Biological Factors

A prevalence of pre-existing health issues may account for high levels of worry and stress in the sample group. For this group, existing health issues meant they needed to shield, access food and medical supplies via others and face restricted healthcare. Evidence suggests that COVID-19 measures have impacted on access to health and care, especially for older people and those with long-term conditions (Benzeval *et al.*, 2020). Of high concern is the later negative impacts of delayed routine medical appointments, for existing and new conditions (Institute of Cancer Research, 2020).

Despite minimal immediate impacts, lifestyle, diet and exercise changes, for example, may, over an extended period, establish habits that will affect long-term health and are therefore of significance (Fontana and Partridge, 2015). Whilst buying food might appear trivial, the ability to choose food is an important factor in healthy choices. People may have felt inhibited to ask specifically for items or found products had sold out. Consequently, many people altered their eating habits, potentially impacting on nutrition and life satisfaction.

The impact of these factors is linked to the respondent's biopsychosocial characteristics. Only people with underlying health issues needed to shield, for example, but doing so alone differed significantly to shielding with someone else. The biological impacts are therefore distributed unevenly across the population (Bibby, 2020). These biological impacts also interact with other psychological and social impacts, with isolation perhaps leading to psychological distress.

Psychological Factors

The far-reaching psychological impacts of COVID-19 identified in our study are similar to findings reported by Torales *et al.* (2020, p.317) who highlight 'additional health problems such as stress, anxiety, depressive symptoms, insomnia, denial, anger and fear globally. Fawaz and Samaha (2020) and Duan and Zhu (2020) also document increases in mental health issues due to COVID-19. Loneliness is also consequential as it is being increasingly recognised as the next critical public health issue (Lim, Eres & Vasan, 2020), significantly impacting longevity, especially in elderly people (NHS, 2015) and is interrelated with anxiety and depression (Domènech-Abella *et al.*, 2019). Loneliness during the Covid-19 lockdown is likely to trigger psychological distress.

Any of these psychological issues may have significance for the individual experiencing it, but the cumulative effect needs consideration. Whilst a moment of difficulty might be

accommodated, enduring anxiety, stress and depression, over several months and from different origins and triggers, could become profoundly difficult (Kendler *et al.*, 1998) increasing day-to-day functional impairment (Gallagher *et al.*, 2020), with the severity increasing with the prevalence of depression and anxiety (Littlefield *et al.*, 1990). These issues will therefore continue to impact on people's ability to return to a normal life potentially leading to a deeply negative, long-term, costly COVID-19 legacy.

Despite this, respondents were not passive 'victims' of circumstance and were actively trying to look after themselves. Other research suggests that understanding existing strategies is crucial to underpin recovery planning as undermining resilience and duplication cannot be afforded (Holmes *et al.*, 2020, p.2). The shadow side of this is to consider the increased psychological effects of COVID-19 on people with fewer resources, resilience and strategies than this survey sample (Casey, 2020).

These psychological impacts interact with biopsychosocial characteristics. For example, an underlying health condition might increase anxiety about contracting COVID-19, an underlying depressive condition could exacerbate a depressive COVID-19 response and live in a small space with highly demanding other occupants can lead to higher stress levels and a lowered ability to cope. These impacts may also act forward, creating further health and social impacts. Living under stress may exacerbate blood-pressure issues, skin conditions and fatigue syndromes, as well as placing strain on relationships.

Social Factors

The employment situation is likely to worsen over time as furlough ceases and more businesses close. This will create additional psychological pressure (Mousteri *et al.*, 2020; Warr and Jackson, 1985) as people lose their jobs and enter a labour market with fewer jobs than applicants. Whilst working online may pay dividends for individuals viz commuting and flexibility, constant online meetings may create burnout, affecting biological as well as psychological health (Sklar, 2020). These factors need weighing carefully in planning for new 'normal' working practices. Reduced income from changes in employment status will affect lifestyle choices (e.g. eating lower quality food), cause anxiety (e.g. worrying about payments), and impact health and psychological outcomes in later life (Murali and Oyeboode, 2005). Moreover, social impacts can create a range of psychological impacts which may also impact in the biological domain, again reinforcing the dynamic and inter-related nature of biopsychosocial impacts and characteristics.

Support Factors

Stated support needs spanned the biopsychosocial domains but were most prevalent in the social domain, although these supports could be cross-cutting. Increased financial aid, for example, would ease psychological distress and social issues such as overcrowded housing.

Equally, community support can increase access to prescriptions and food whilst decreasing loneliness (Theeke & Mallow, 2013).

Few financial support issues were raised here, but evidence of increased use of food banks (Trussel Trust, 2020) and applications for Universal Credit (Department for Work and Pensions, 2020) suggest the prevalence of financial need in wider society. As a period of economic depression begins following an era of state disinvestment in services (Marmot, 2020), the needs of the most deprived and those living in the most challenging circumstances, should be financial priorities.

The COVID-19 pandemic has accelerated the move to online services (Randhawa *et al.*, 2019) and this may endure beyond COVID-19. Here, people of all ages and situations reported using digital technology for social interactions. Digital contact may have been more important for those shielding due to the heightened risks of anxiety and depression (Elwell-Sutton *et al.*, 2019). Nevertheless, whilst digital services offer an apparent 'equality of access' without leaving the house (Bleyel *et al.*, 2020), inequality is inherent as not everyone has access to a computer or broadband, nor the skills and confidence to use them (Capgemini, 2020).

A tenth of the respondents reported needing no support, indicating relative self-sufficiency. It is worth revisiting the sample, who were predominantly age experienced (45-65) and socio-economically advantaged (private houses, gardens, stocks and shares). This must not detract our attention from the many less privileged people in society who may have more acute, complex and enduring needs (Bibby *et al.*, 2020).

The data reported here illustrates the interacting nature of the impacts from COVID-19 and its control measures; indicating that certain groups of people may be more predisposed to a combination of factors. This phenomenon has led some to adopt intersectional analyses of the impacts of COVID-19 (Bowleg, 2020) whilst others use a syndemic approach (Holmes *et al.*, 2020). In this paper, we have argued that a biopsychosocial approach (Engels, 1977; Marmot, 2005; CSDH, 2010) is useful in understanding the range and overlap between factors, as shown in figure i below. Findings from this research, and others, highlights the need for a nuanced, complex, intersectional, understanding of COVID-19 and that planning for recovery must be informed from a similar standpoint.

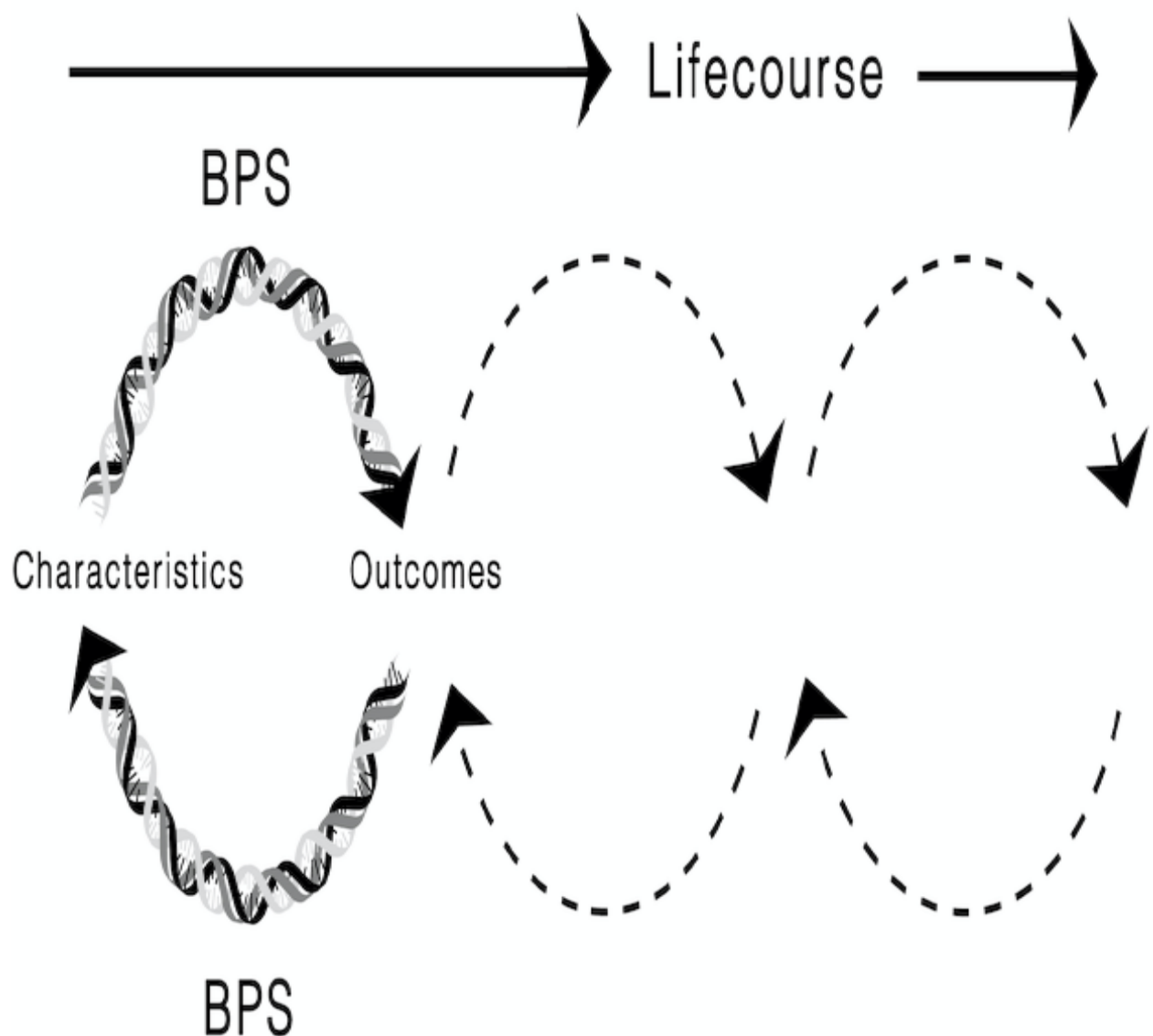


Figure i: The Biopsychosocial Model of Lifecourse Outcomes

Implications

Support, therefore, needs to encompass biopsychosocial factors as well as the interaction between them. Support needs to be equitable, differentiated to individual group needs, rather than a one size fits all approach (Holmes *et al.*, 2020, p.2; Lancet Editorial, 2020). These sentiments are echoed by other researchers who call for substantial, differentiated and complex recovery measures in the short and long term (Abrams and Szeffler, 2020; Bibby *et al.*, 2020; Douglas *et al.*, 2020; Torales *et al.*, 2020).

At an organisational level, we propose an alignment of effort across sectors and disciplines. An extensive literature on integrated working (Stuart *et al.*, 2014) has demonstrated the importance of collaboration and this pandemic has prompted some to set aside silos

especially. Health, education, social care, community and family services in public, private and charitable sectors need to work together if we are to sustain the changes needed in an economic depression. These resources should be located within communities, or place-based (Public Health England *et al.*, 2020), reaching all; tailored to each community's needs and minimise the risk of travel for community members. The solutions would not only be differentiated for each community but would also take advantage of new delivery modalities, such as videoconferencing and telemedicine.

At a practitioner level, we recommend all conversations between practitioners and their 'clients' are informed by a BPS approach aka Smith et al. (2013). These would ensure practitioners understood the health, mental wellbeing and social impacts of COVID-19 on individuals, guaranteeing support is offered holistically. These approaches should be asset-balanced with individuals and communities deploying their strengths, organisations amalgamating resources, and the state adding funding for further leverage. These efforts would work to address the relevant biopsychosocial issues present. Whilst 'recovery' would be a laudable success of such endeavours, sights should be set higher and aim for 're-growth'. We do not want to reinstate communities, rather use this situation to improve their lives, enabling people to feel good and function in thriving communities. The following framework (table ii) might offer a planning matrix for this place-based provision.

Table ii: The Biopsychosocial Recovery Framework

	Biological Support	Psychological Support	Social Support
Individual assets	Lifestyle choices e.g. diet, exercise	Lifestyle choices e.g. no social media	Lifestyle choices e.g. family FaceTime
Community assets	Check in's, networks, socially prescribed services e.g. prescription collection service	Check in's, networks, socially prescribed services e.g. community buddy system	Check in's, networks, socially prescribed services e.g. community sing / quiz night / walk
Assets of private and voluntary sector organisations	Network of services relevant to area e.g. weight control group	Network of mental health support services e.g. MIND	Network of social support services e.g. Age UK
State assets	NHS appointments, services, treatments	MH / CAMHS appointments, services, treatments	Social care appointments, services, treatments
State funding	At all previous levels		

Conclusion

The findings reported here illustrate the interplay of biological, psychological and social factors in managing the COVID-19 control measures. The analysis shows that the BPS framework can be used to consider risk factors for each element and how they interact. The findings illustrate the framework's use in understanding the biopsychosocial impacts from COVID-19, each in their own right, and as a set of intertwined factors. Further, each new characteristic can create future biopsychosocial impacts and vice versa, in the short and long term. A single biological response to the pandemic is therefore inadequate, the psychological and social strands also need consideration. The findings imply the need for nuanced, place-based, contextual, integrated planning for individuals and groups across all three domains to create virtuous biopsychosocial trends within communities. At the ground level, the findings suggest the need for all practitioners to discuss biopsychosocial risk factors and impacts with their 'clients' to understand and address their needs holistically. The BPS theoretical framework is therefore useful to assess risk factors, structure client conversations, and underpin recovery planning. The BPS model is underpinned by complexity theory, contributory in such complex and unprecedented times as a global pandemic. It is useful both as a theoretical framework, and practical guide to actions. Further research is needed into how effectively the account of complexity provided by the BPS framework positively impacts on outcomes in communities.

Over time, the use of BPS approaches at practice, organisational and national levels could reduce the reliance of communities and individuals on state services, but this will take a significant investment. With public attitude in favour of equitable solutions and re-investment in education, health and social care, this could be the moment to achieve significant improvements in social justice, enabling all to feel and function better than before the pandemic.

References

Abrams, E.M., Szeffler, S.J. (2020). COVID-19 and the impact of social determinants of health – Comment, *Lancet Respiratory Medicine*, 18th May 2020. [https://doi.org/10.1016/S2213-2600\(20\)30234-4](https://doi.org/10.1016/S2213-2600(20)30234-4)

Aked, J., Marks, N., Cordon, C. Thompon, S., (2008). *Five Ways to Well-being*. London: New Economics Foundation.

Alonso Y. (2004). The biopsychosocial model in medical research: The evolution of the health concept over the last two decades, *Patient Education and Counseling* 53: 239–244.

Alvarez A.S., Pagani M., Meucci P. (2012). The clinical application of the biopsychosocial model in mental health: a research critique, *American Journal Physical Medical Rehabilitation*, 2012; 91(suppl):173-180.

Assi, S., Unadkat, V.A., Patel, B., Ravindrane, R., Wardle, H. (2020). Poverty, inequality and COVID-19: the forgotten vulnerable: Letter to the Editor, *Public Health*, 183(2020), pp.110-111.

Benning, T. (2015). Limitations of the biopsychosocial model in psychiatry, *Advances in Medical Education and Practice*, 2015 (6): 347-352.

Benzeval, M., Booker, C., Burton, J. (2020). *Understanding Society COVID-19 Survey. April Briefing Note: Health and Caring, Understanding Society Working Paper No 11/2020*, ISER, University of Essex. Available at <https://www.understandingsociety.ac.uk/sites/default/files/downloads/working-papers/2020-11.pdf> (accessed 14/06/2020).

Bibby, J., Everest, G., Abbs, I. (2020). *Will COVID-19 be a watershed moment for health inequalities? The Health Foundation*, 7/5/2020. Accessed 17/6/2020 at https://www.health.org.uk/publications/long-reads/will-covid-19-be-a-watershed-moment-for-health-inequalities?utm_campaign=11582911_COVID-19%20and%20health%20inequalities%20%2011%20June%202020%20%20WARMandutm_medium=emailandutm_source=The%20Health%20Foundationanddm_i=4Y2,6W9FJ,UV5P29,RP6OU,1

Bleyel, C., Hoffmann, M., Wensing, M., Hartmann, M., Friederich, H. C., Haun, M. W. (2020). Patients' perspective on mental health specialist video consultations in primary care: Qualitative pre-implementation study of anticipated benefits and barriers. *Journal of Medical Internet Research*, 22(4), e17330

Bolton, D., Gillet, G. (2019). *The Biopsychosocial Model of Health and Disease: New Philosophical and Scientific Developments*. Cham (CH): Palgrave Pivot.

Boseley, S. (2020). Why doctors say UK is better prepared for a second wave of coronavirus. Guardian Online, Accessed 22/06/2020 at <https://www.theguardian.com/world/2020/jun/22/why-doctors-say-uk-better-prepared-for-second-wave-coronavirus>

Bowleg, L. (2020). We're Not All in this Together: On COVID-19, Intersectionality, and Structural Inequality, *American Journal of Public Health*, 110(7), p.917.

Brannen, J. (2005) Mixed Methods Research a Discussion Paper, *NCRM Methods Review Papers*, London: NCRM.

Capgemini (2020). *The Great Digital Divide*. London: Capgemini Research Institute.

Casey, R. (2020). COVID-19 is a greater health risk to people on low incomes: we can give a life-line, *Joseph Rowntree Foundation*. Accessed 13/7/2020 at <https://www.jrf.org.uk/blog/covid-19-greater-health-risk-people-low-incomes-we-can-give-life-line>

Creswell, J., Plano Clark, V. (2007). *Designing and conducting mixed methods research*. London: Sage.

Department of Work and Pensions (2020). Universal Credit declarations (claims) and advances: management information. Accessed 18/6/2020 at <https://www.gov.uk/government/publications/universal-credit-declarations-claims-and-advances-management-information>

Domènech-Abella, J., Mundó, J., Haro, J. M., & Rubio-Valera, M. (2019). Anxiety, depression, loneliness and social network in the elderly: Longitudinal associations from The Irish Longitudinal Study on Ageing (TILDA). *Journal of affective disorders*, 246, 82-88.

Douglas, M., Katikireddi, S., Taulbut, M., McKee, M., McCartney, G. (2020). Mitigating the wider health effects of covid-19 pandemic response, *British Medical Journal*, 2020;369:m1557 doi: 10.1136/bmj.m1557.

Duan, L., Zhu, G. (2020). Psychological interventions for people affected by the COVID-19 epidemic. *The Lancet Psychiatry*, 7(4), 300–302.

Elwell-Sutton, T., Folb, N., Clark, A., Fairall, L. R., Lund, C., and Bachmann, M. O. (2019). Socioeconomic position and depression in South African adults with long-term health conditions: a longitudinal study of causal pathways. *Epidemiology and psychiatric sciences*, 28(2), 199-209.

Engel, G.L. (1960). A unified concept of health and disease, *Perspect. Biol. Med.* 1960, 3, 459–485.

Engel, G.L. (1977). The need for a new medical model: a challenge for biomedicine, *Science*, 196: 129-136.

Farre, A., Rapley, T. (2017). The New Old (and Old New) Medical Model: Four Decades Navigating the Biomedical and Psychosocial Understandings of Health and Illness, *Healthcare*, 5(88): pp.1-9.

Fawaz, M., Samaha, A. (2020). The psychosocial effects of being quarantined following exposure to COVID-19: A qualitative study of Lebanese health care workers, *International Journal of Social Psychiatry*, 1-6. DOI: 10.1177/0020764020932202.

Flowers, P., Davis, M., Lohm, D., Waller, E., Stephenson, N. (2016). Understanding pandemic influences behaviour: An exploratory biopsychosocial study, *Journal of Health Psychology*, 21(5): 759-769.

Fontana, L., Partridge, L. (2015). Promoting health and longevity through diet: from model organisms to humans. *Cell*, 161(1), 106–118. <https://doi.org/10.1016/j.cell.2015.02.020>

Gagliese, L., Gauthier, L.R., Narain, N., Freedman, T. (2018). Pain, aging and dementia: towards a biopsychosocial model, *Progress in Neuropsychopharmacology*, (2018), pp.207-215.

Gallagher, M. W., Zvolensky, M. J., Long, L. J., Rogers, A. H., & Garey, L. (2020). The Impact of Covid-19 Experiences and Associated Stress on Anxiety, Depression, and Functional Impairment in American Adults. *Cognitive Therapy and Research*, 1-9.

Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S. (2020). Mental health problems and social media exposure during COVID-19 outbreak. *PLoS ONE* 15(4): e0231924. <https://doi.org/10.1371/journal.pone.0231924>

Gilbert, P. (2019) Psychotherapy for the 21st Century: An integrative, evolutionary, contextual, biopsychosocial approach, *Psychology and Psychotherapy: Theory, Research and Practice*, 92:164-189.

Griffith, D.M., Sharma, G., Holliday, C.S., Enyia, O.K., Valliere, M., Semlow, A.R., Stewart, E.C., Blumenthal, R.S. (2020). Men and COVID-19: A Biopsychosocial Approach to Understanding Sex Differences in *Mortality and Recommendations for Practice and Policy Interventions*, *Preventing Chronic Disease: Public Health Research, Practice and Policy*, 17(E63): 1-9.

Hargarten, S.W., Lemer, E.B., Gorelick, M., Brasel, K., deRoos-Cassini, T., Kohlbeck, S. (2018). Gun Violence: A biopsychosocial Disease, *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health*, 19(6): 1024-

Holmes, E.A., O'Connor, R.C., Perry, H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Cohen Silver, R., Everall, I., Ford, T., John, A., Kabir, T., King, K., Madan, I., Michie, S., Przybylski, A.K., Shafran, R., Sweeney, A., Worthman, C.M., Yardley, L., Cowan, K., Cope, C., Hotopf, M., Bullmore, E. (2020). Multidisciplinary research priorities for the

COVID-19 pandemic: a call for action for mental health science, *The Lancet Psychiatry*, April 15th 2020, /doi.org/10.1016/S2215-0366(20)30168-1

Institute of Cancer Research (2020). Thousands of lives could be lost to delays in cancer surgery during COVID-19 pandemic. Available at: <https://www.icr.ac.uk/news-archive/thousands-of-lives-could-be-lost-to-delays-in-cancer-surgery-during-covid-19-pandemic> (20 May 2020, accessed 14/06/2020).

Kendler, K., Karkowski, L., Prescott, C. (1998). Stressful Life Events and Major Depression: Risk Period, Long-Term Contextual Threat, and Diagnostic Specificity, *The Journal of Nervous and Mental Disease*, 186(11), 661-669.

Kirby, T. (2020). Evidence mounts on the disproportionate effect of COVID-19 on ethnic minorities. *The Lancet Respiratory Medicine*, 8(6), 547-548.

Kontos, N. (2011). Biomedicine - Menace or Straw Man? Reexamining the Biopsychosocial Argument, *Academic Medicine*, 86: 509-515.

Lim, M. H., Eres, R., & Vasan, S. (2020). Understanding loneliness in the twenty-first century: an update on correlates, risk factors, and potential solutions. *Social Psychiatry and Psychiatric Epidemiology*, 1-18.

Littlefield, C. H., Rodin, G. M., Murray, M. A., & Craven, J. L. (1990). Influence of functional impairment and social support on depressive symptoms in persons with diabetes. *Health Psychology*, 9(6), 737.

Marmot, M. (2005). Remediable or preventable social factors in the aetiology and prognosis of medical disorder. In P.D. White (Ed.) *Biospsychosocial Medicine: An Integrated Approach to Understanding Illness*. New York: Oxford University Press, pp.39-58.

Marmot, M. (2020). *Using Marmot Principles to Support Health Inequalities Post Covid-19*. LGA Webinar, 23rd June 2020. Accessed 15/7/2020 at <https://www.local.gov.uk/using-marmot-principles-tackle-health-inequalities-and-covid-19-23-june-2020>

Marmot, M., Allen, J., Goldblatt, P., Boyce, T., McNeish, D., Grady, M., and Geddes, I. (2010). *Fair society, healthy lives: Strategic review of health inequalities in England post 2010*. Accessed 24.12.19 at www.instituteofhealthequity.org/projects/fair-society-healthy-lives-the-marmot-review

Marmot, M., Allen, J., Boyce, T., Goldblatt, P., Morrison, J. (2020). *Health Equity in England: the Marmot Review 10 Years On*. Accessed 31.3.20 at <https://www.health.org.uk/publications/reports/the-marmot-review-10-years-on>

Mousteri, V., Daly, M., Delaney, L. (2020). Underemployment and psychological distress: Propensity score and fixed effects estimates from two large UK samples. *Social Science and Medicine*, 244, 112641.

Murali, V., and Oyeboode, F. (2004). Poverty, social inequality and mental health, *Advances in Psychiatric Treatment*, 10(3), 216-224. doi:10.1192/apt.10.3.216

NHS (2015). Loneliness 'increases risk of premature death', accessed 13/7/2020 at <https://www.nhs.uk/news/mental-health/loneliness-increases-risk-of-premature-death/>

Office for National Statistics (2020). Deaths involving COVID-19 by local area and socioeconomic deprivation: deaths occurring between 1 March and 17 April 2020. London: UK Government.

Polit, D. F., and Beck, C. T. (2008). Is there gender bias in nursing research?. *Research in nursing and health*, 31(5), 417-427.).

Public Health England (PHE) in collaboration with the Local Government Association (LGA), Association of Directors of Public Health (ADPH), NHS England and NHS Improvement (2020). Covid-19 Place Based Approach to Reducing Health Inequalities. Accessed 13/7/2020 at https://www.local.gov.uk/sites/default/files/documents/COVID-19%20place%20based%20approach%20to%20reducing%20health%20inequalities%20overview_0.pdf

Qi, R., Chen, W., Liu, S, Thompson, P., Long, D., Zhang, J., Xia, F., Cheng, F., Hong, A., Surento, W., Lou, S., Yuan Sun, Z., Sheng Zhou, C., Li, L., Jiang, X., Ming Lu, G (2020) Psychological morbidities and fatigue in COVID-19 patients during disease outbreak: prevalence and associated biopsychosocial risk factors, *medRxiv* 2020.05.08.20031666; doi: <https://doi.org/10.1101/2020.05.08.20031666> 1-21.

Randhawa, R. S., Chandan, J. S., Thomas, T., and Singh, S. (2019). An exploration of the attitudes and views of general practitioners on the use of video consultations in a primary healthcare setting: a qualitative pilot study. *Primary health care research and development*, 20.

Redwood, S., and Gill, P. S. (2013). Under-representation of minority ethnic groups in research—call for action, *British Journal of General Practice*, 63 (612): 342-343. DOI: <https://doi.org/10.3399/bjgp13X668456>

Sklar, J. (2020). 'Zoom fatigue' is taxing the brain, *National Geographic*, accessed 13/7/2020 at <https://www.nationalgeographic.co.uk/science-and-technology/2020/04/zoom-fatigue-is-taxing-the-brain-heres-why-that-happens>

Smith, R.C.; Fortin, A.H.; Dwamena, F.; Frankel, R.M. (2013). An evidence-based patient-centered method makes the biopsychosocial model scientific. *Patient Educ. Couns.* 2013, 91, 265–270.

Social Media Research Group (2016). *Using Social Media for Social Research: An Introduction*. London: Government Social Research Unit.

Sung-Wan, K., Kuan-Pin, S. (2020). Using psychoneuroimmunity against COVID-19, *Brain, Behaviour and Immunity*, 87: 4-5.

Stuart, K. (2014). Collaborative Agency to Support Integrated Care for Children, Young People and Families: An Action Research Study the *International Journal of Integrated Care*, (14), pp.1-13.

Stuart, K. Moshuus, G., Bunting, M., Graveson, D., Holvig, S., Frostholt, P. Cammack, P., Walker, S., Boyd, P. (2019). An Equalities Literacy Framework for Practitioners Working with Children, Young People and Families through Action Research, *Educational Action Research*, doi.org/10.1080/09650792.2019.1593870

Stuart, K., Bidmead, E., Browning, R., Grimwood, S., Roberts, C. (2020). Biosychosocial research into Covid-19: Further Findings. Carlisle: University of Cumbria. Accessible at: <https://www.cumbria.ac.uk/media/university-of-cumbria-website/content-assets/public/researchoffice/documents/Covid-19-Research-Further-Findings-July-2020-v2.pdf>

Tashakkori, A., and Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.

Tavory, I., Timmermans, S. (2014). *Abductive Analysis: Theorising Qualitative Research*. Chicago: University of Chicago Press.

Theeke, L. A., & Mallow, J. (2013). Loneliness and quality of life in chronically ill rural older adults: Findings from a pilot study. *The American journal of nursing*, 113(9), 28.

Torales, J., O'Higgins, M., Castaldelli-Maia, J.M., Ventriglio, A. (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health, *International Journal of Social Psychiatry*, 66(4), pp.317-320. DOI: 10.1177/0020764020915212

Trussel Trust (2020). *What we do*. Accessed 17/6/2020 at https://www.trusselltrust.org/food-banks-report-record-spike/?utm_source=Bristol+University+Press%2FPolicy+Press+sign+up+listandutm_campaign=2fcf053100-Food+campaign+Apr+20andutm_medium=emailandutm_term=0_f395de8081-2fcf053100-129943481

Wade, D.T., Halligan, P.T. (2017). The biopsychosocial model of illness: a model whose time has come, *Clinical Rehabilitation*, 31(8): 995-1004.

Warr, P., and Jackson, P. (1985). Factors influencing the psychological impact of prolonged unemployment and of re-employment, *Psychological Medicine*, 15(4), 795-807.
doi:10.1017/S003329170000502X

Wojatzki, M., Mohammad, S., Zesch, T., Kiritchenko, S. (2018). Quantifying Qualitative Data for Understanding Controversial Issues, *Proceedings of the Eleventh International Conference on Language Resources and Evaluation (LREC 2018)*, May 2018; Miyazaki, Japan, European Language Resources Association (ELRA).

Ye, J. (2020). Pediatric Mental and Behavioural Health in the Period of Quarantine and Social Distancing with COVID-19, *JMIR Pediatr Parent*, 3(2): 1-8.