"My best card against my mental health": A Qualitative Analysis of Blue Space and The Self-Management of Mental Health Symptoms.

Submitted by Emily Hale, to the University of Exeter

as a thesis for the degree of Doctor of Clinical Psychology, May 2021

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SCHOOL OF PSYCHOLOGY

DOCTORATE IN CLINICAL PSYCHOLOGY

LITERATURE REVIEW

The Relationship Between Blue Space and Health: A Systematic Review of Qualitative Research

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Abstract

Background: There is increasing research and policy interest in the potential use of outdoor water environments, or blue space, in the promotion of human health and wellbeing. In recent years, research has sought to understand the relationship between blue space and health, but there remains a gap in understanding whether health benefits identified following blue space interventions can be extended to recreational exposure to blue space.

Objectives: This systematic review summarises and synthesises the qualitative literature addressing the gap in understanding how the recreational use of blue space impacts human health.

Method: Systematic review of all literature to date using OVID (Psych INFO), EBSCO (Psychology and Behavioural Science Collection) and PubMed (Medline) databases.

Results: Six relevant papers were included, consisting of five thematic analyses and an interpretative phenomenological analysis.

Conclusions: There is a small amount of research that supports the notion that recreational use of blue space has a positive impact on psychological, physiological, and social health. The evidence base considers specific health outcomes relating to people who have physical health difficulties but does not consider how the use of blue spaces and health outcomes may be different in people with psychological difficulties. It suggests that the unique qualities of blue space are important for health promotion but suggests mechanisms remain unclear. Appropriate additional research is outlined.

Keywords: Blue Space, Psychological Health, Physical Health, Health Promotion.

Introduction

This chapter begins by reporting on systematic reviews of blue space to give an overarching view of the existing literature base and then focusses more specifically on the focussed literature review.

Health: "physical, mental and social wellbeing and not merely the absence of disease or infirmity…a resource for everyday life, not the objective of living. Health is a positive concept emphasising social and personal resources, as well as physical capacities" (Bircher, 2005).

A wave of epidemiological evidence indicates that exposure to natural environments, namely green (i.e., woodlands) and blue (i.e., beaches, lakes) space, is associated with better health and wellbeing, and natural spaces have become widely acknowledged as important settings for health promotion (DEFRA, 2011; Hansen-Ketchum & Halpenny, 2011; WHO, 2019). As a result, public policy and research attention in the area has noticeably increased over recent years (White et al., 2020; WHO, 2019). The relationship between health and green space has received comparatively more interest than blue space; however, in the wake of green space literature, interest in the potential use of blue space in the promotion of people's health and wellbeing is growing (White et al., 2020; De Vries et al., 2003). This interest can be seen in a developing evidence base and large funded research initiatives such as BlueHealth, investigating the links between natural blue environments and health (Depledge & Bird, 2009).

At the time of writing, there was only one literature review specifically concerning qualitative methodologies and blue space (Britton et al., 2018).

Britton et al. (2018) aimed to understand whether interventions augmented by blue space (such as surfing, sailing and fishing) in participants presenting with a variety of physical, social, cognitive and mental health difficulties (cancer survivors, people with learning disabilities, people with anxiety/depression/post-traumatic stress disorder) were effective in improving health outcomes. There was an emphasis on active (rather than passive) interventions. Britton's literature review identified positive and weak associations between formal therapeutic blue space-based practices and health and wellbeing indicators. It highlighted very few findings for physical health outcomes (Britton et al., 2018). The studies included in this review generally had small sample sizes, high risk of self-selection bias, and a lack of control groups, limiting the transferability of the conclusions and findings. There was also a significantly poor description of participant characteristics and absence of diversity in participant selection (age, gender, ethnicity, socioeconomic status) in many of the included studies, further minimising the generalisability of the conclusions.

When designing and completing this review, there were only two other reviews regarding blue space and health. One was s a meta-analysis considering the impact of blue space on human health and wellbeing, mainly focussing on Salutogenic health effects (focusing on factors that support human health and well-being) of inland surface waters (Völker & Kistemann, 2011). The studies included in Völker & Kistemann's review were mostly experimental studies or cross-sectional surveys, focusing on students as the subject group. This review introduced the term 'blue' space, differentiating it from the generic therapeutic landscapes terminology of the time, suggesting a specific model which focussed on the 'blue' component of therapeutic landscapes. Their model highlighted appropriative dimensions of blue spaces (experienced space,

activity space, social space, symbolic space) but commented that this concept could not yet be extended to coastal/marine environments.

The second was Gascon et al. (2017), who reviewed 35 quantitative studies, 22 of which were considered ‘good quality’, and evaluated the relationship between blue space and health. The review highlighted consistent evidence of positive associations between blue space exposure and physical activity and mental health, with less consistent evidence of an association between blue space exposure and physical health outcomes (Gascon et al., 2017). Gascon highlighted limitations of the review primarily related to a narrow research base and high heterogeneity around the classification of mental health (Gascon et al., 2017)[1].

A detailed and focused review of non-interventional qualitative literature would complement Britton et al.’s (2018) review as it would capturing the wider qualitative evidence base. By definition, intervention is the action or process of intervening and, in the context of blue space, implies that exposure is not autonomous (asked by a clinician/researcher to attend a planned activity/intervention). A review of autonomous non-interventional research would provide a counterbalance in assessing Britton et al.’s (2018) conclusion that it is the activities in blue space rather than qualities of blue space that might contribute to rehabilitation and health promotion. There is a need to understand whether health benefits identified following blue space interventions are the same/different to those following recreational use of blue space. This has

[1] After the scoping search in Autumn of 2020, a further narrative review was published in December 2020 (White et al., 2020). White’s review of qualitative and quantitative literature resulted in the development of a broad model suggesting how exposure to blue spaces may interact with health and well-being.

implications for how blue spaces are incorporated meaningfully and appropriately at an individual and policy level for public health benefit.

In their seminal review, Völker & Kistemann (2011) highlighted a need for more qualitative research considering the relationship between blue space and health. All subsequent reviews have echoed this call, particularly concerning more naturalistic research. Thus, it seems appropriate that a decade after the publication of the first blue space literature review, a systematic review of qualitative research regarding the relationship between health and naturalistic/ non-interventional exposure to blue space is completed, and a comprehensive understanding of the qualitative literature is sought. A biopsychosocial model of health recognises the complex factors affecting individual health and conceptualizes health (Engel., 1997). This multidimensional framework will be used to structure this review and integrate the findings of the papers. This review will discuss the findings through a lens of psychological theory and considers how our relationship, experience and use of blue space links with theories regarding motivation, attention, mental health and salutogenisis.

Literature Review Question

This literature review asks the following question: To date, what are the empirical qualitative research findings concerning the relationship between blue spaces and health in non-interventional contexts?

Methodological Approach

Search Strategy

The PICOS tool was used to develop the search terms, inclusion/exclusion criteria and screening strategy. It focused on designing search terms related to the Population (people of any age), Intervention (blue space exposure), Comparison (optional and not relevant for this review of non-

experimental literature), Outcomes (physical/mental health outcomes) and Study design (qualitative) of an article.

Based on the PICOS criteria, a combination of keywords related to outdoor blue spaces (i.e., blue space, beach, river, lake, coastal, marine) combined with keywords related to physical and mental health (i.e., depression, anxiety, mental health; physical health) as well as keywords related to a qualitative style analysis (i.e., qualitative, phenomenological, grounded theory, thematic analysis) were entered into the databases. The complete electronic search term strategy for each database is included in Appendix A.

Exclusion/Inclusion Criteria

Inclusion and exclusion criteria, guided by PICOS criteria for literature abstract screening, are outlined in Table 1 (Methley et al., 2014).

Table 1.

Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
1. No therapeutic/intervention-based information used as data (can include studies where blue space activity is part of the experience but is not organised/manipulated by the researchers, e.g. Wild swimming, walking etc.).	1. Therapeutic/intervention-based information used as data (e.g. swimming group organised by the researcher, pre-post swimming interviews etc.)
2. Evidence of an empirical qualitative orientation – that is,	2. Evidence of an empirical quantitative orientation – that

analysis of data and reporting of findings is done using qualitative techniques.	is, analysis of data and reporting of findings is done using quantitative techniques.
3. The primary focus is the relationship between health/wellbeing and natural (non-manmade), blue space (rivers, lakes, coasts, sea, etc.)	3. The primary focus is on something other than the relationship between health and blue environments (health and green environments or general natural environments).
4. Primary research	4. Book reviews, books, commentaries, literature reviews, policy documents
5. Published in English and in countries where English is the first language	5. Published in other languages or in countries where English is not the first language
6. Peer-reviewed paper	6. Non-peer-reviewed paper
7. Participants of any age	

Method

Three electronic databases were searched through the University of Exeter's electronic library: via OVID (Psych INFO), via EBSCO (Psychology and Behavioural Science Collection) and PubMed (Medline), as they are the key databases for psychology and health. Articles were sought, which were published up to 2nd December 2020, the search date. References from

retrieved and included articles were also used in the search for additional papers.

The search, collection, and review of the literature was conducted following the guidelines put forth by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement from the start to optimise the systematic reviewing of the scientific research through maximising rigour (Moher, Liberati, Tetzlaff & Altman, 2009) and minimising bias (Kearney, 2014). A PRISMA diagram shows the flow of the search process (see figure1) (Moher et al., 2009). On retrieval, duplicates were first removed; subsequently, titles and abstracts were read for eligibility according to the PICOS structured inclusion/exclusion criteria. Finally, the full text was read for the remaining papers.

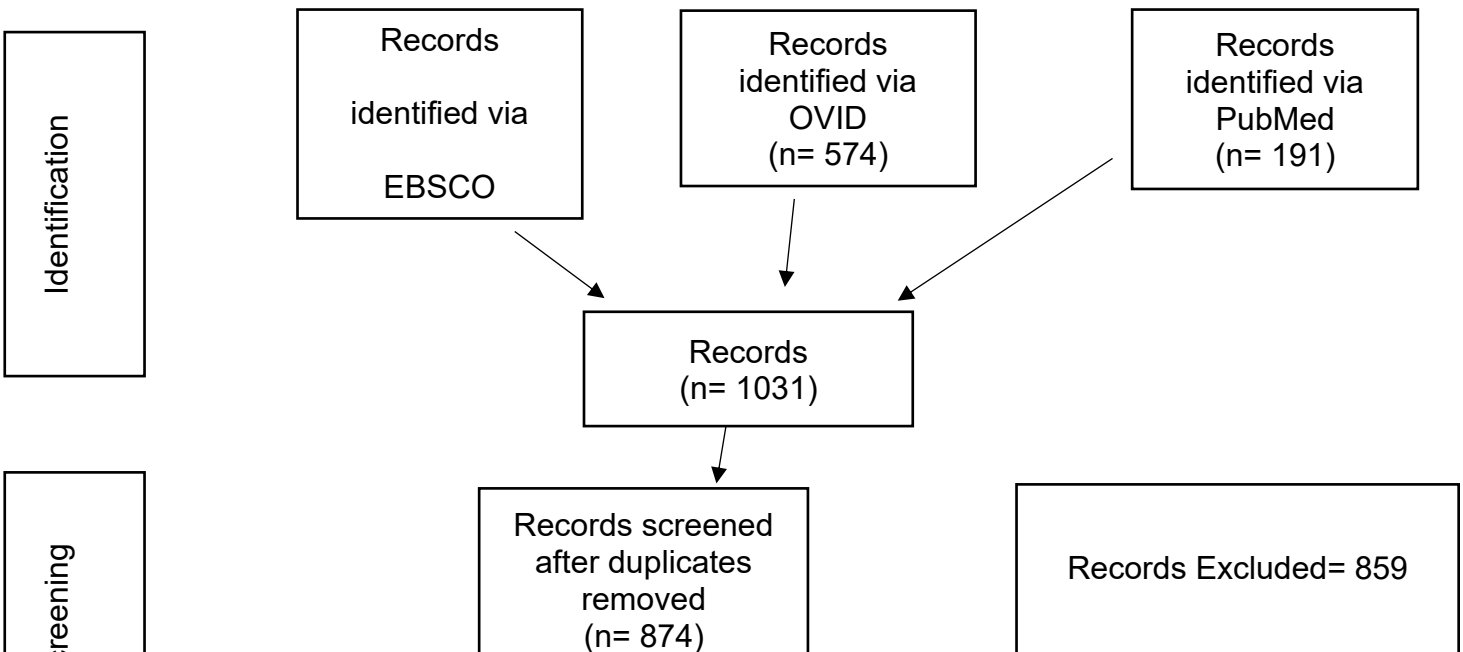
Evaluation Criteria

Studies included in the literature review were scored according to the Critical Appraisal Skills Programme (CASP) checklist for qualitative research (CASP, 2013). The CASP checklist provides a structure by which to appraise a report of qualitative research (Appendix B), asking questions such as whether the research methodology was appropriate, whether ethical issues have been taken into consideration and whether the data analysis was sufficiently rigorous. A second independent reviewer assessed three papers with a perfect observer agreement indicated through a Cohen Kappa score of 1.00 (Landis & Koch, 1977). The number of papers co-reviewed was informed by the academic guidance for this review from the University of Exeter. An inter-rater reliability check was completed, and there was complete agreement that all studies met the inclusion criteria for the review.

Themes from each of the papers were identified and listed along with the paper's CASP score (Table 2). A thematic synthesis of the themes arising from the papers was used to identify common themes from the papers' findings (Barnett-Page & Thomas., 2009). As there is little evidence about decisions to exclude studies on the basis of their quality (Thomas and Harden, 2008), all studies that were identified as being relevant after full-text screening were included.

Results

One thousand thirty-one papers were retrieved by the search, screened, and assessed for eligibility for inclusion. The study selection strategy is illustrated in Figure 1.



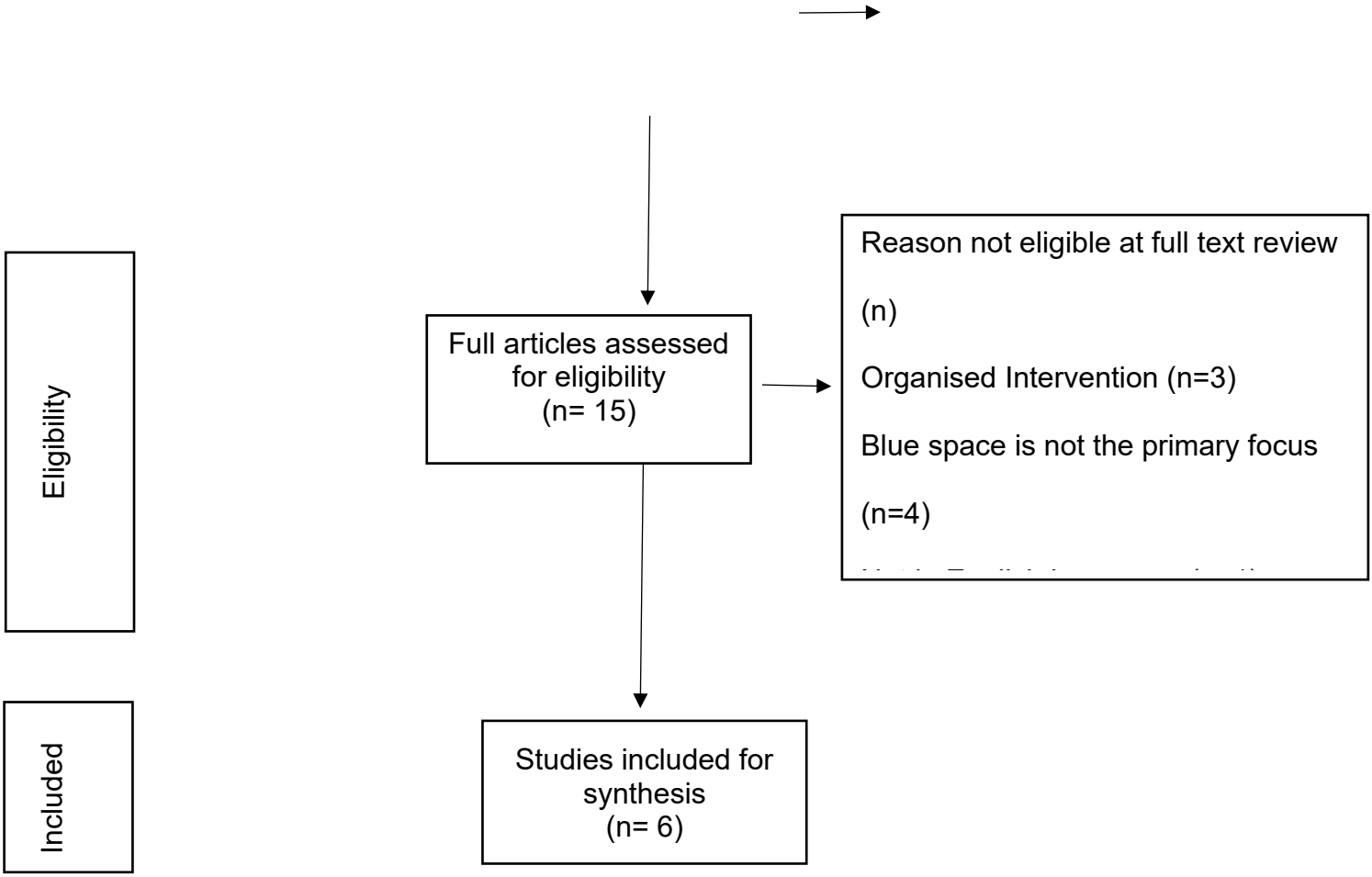


Figure 1. *Results of literature review search strategy and screening. Flow chart based upon PRISMA Protocol (Moher et al., 2009)*

Summary of the Aims, Data Analysis & Methods of Included Papers

Six papers were included in the literature review. Table 2 summarises the included studies, their CASP scores and their findings and is followed by a more detailed summary.

Table 2.

Summary of papers included in the systematic review.

Reference	Country	Aim	Method	Analysis	Limitations	Findings	CASP Score
#1 Coleman & Kearns, 2015	New Zealand	Understand how island-bound seniors experience later life in light of the relative ubiquity of blue spaces	Stage 1: In-depth interviews N=28 (8M, 20F) Stage 2: Photo elicitation interviews and participant journal, N=11 (3M, 8F)	Phenomenological interpretive perspective (IPA),	Unique New Zealand island residential care environment	Engaging with seascapes may positively shape daily experiences and wellbeing during ageing-in-place	9/10
#2 Bell, Phoenix, Lovell	England	Understand what	Stage 1: GPS and	Thematic analysis	Small self-selected sample	Symbolic, achievement-	9/10

& Wheeler, 2015	characterises therapeutic experiences of blue space	accelerometer for a week N=33 Stage 2: Open questioning in-depth case study's N=9		oriented, immersive and social experiences contributed a sense of wellbeing; enduring connections to the local coastline; different coastal stretches perceived to cater for varied needs.

#3 Ashbullby, Pahl, Webley & White, 2013	England	Understand how families use natural coastal environments in health-promoting ways; Understand potential benefits to health and barriers/ enablers to families' engagement	Individual semi structured interviews: Families N=15 Parents N= 24 Children (aged 8-11) N= 20	Thematic analysis	A high proportion of families where the parents had a degree (15:7), owned a car and visited the beach frequently.	Families valued the opportunities for physical activity and active play afforded by beaches; the key health benefits emphasised were psychological; barriers to visits included the cost of parking, lack of car access and weather.	10/10

#4 Costello, McDermott, Patel & Dare, 2019	Australia	Understand experiences of wild ocean swimming in older people living in Perth	Individual interviews N=17 (10M, 7F)	Thematic analysis	Small sample size, limited location, over 55's only.	Personal experiences and social connectedness mediate the use of blue space; swimming group membership promotes health and wellbeing, supports the development of self-efficacy and resilience.	7/10

#5 Foley, 2015	Ireland	Critical assessment of swimming as a potentially healing act	Part 1: Observer participation and swimmer's accounts from on and within water N=22 Part 2: primary non-structured interviews N=4	Thematic analysis	Findings may be limited to colder climates, small sample size for primary interviews	The act of swimming is an emplaced and performed therapeutic encounter; critical discussion of narratives associated with risk	9/10
#6 Foley, 2017	Ireland	Understand how specific blue places and practices enable health	Researcher diary, researcher videos Non-structured oral history interview N=20	Thematic analysis	limited age range, limited to colder climates	Importance of both swimming practices and places; repeated experiences build healthy	8/10

			resilience; aspects of health are enhanced by coastal swimming in relation to bodies perceived to be inactive due to age, illness or disability.

Aims

All papers included in this review offered some evidence of the relationship between blue coastal spaces and health. Due to the wide scope of the review question, the aims of the papers varied. For example, studies differed in exploring who interacts with blue spaces; families, elderly, adults, and how they use blue environments; leisure, exercise, relaxation, socialising. All studies aimed to understand more about the possible mechanisms by which blue environments have therapeutic effects on people's health, be it psychological, social, or physical.

Methods

The studies consisted of variable sample sizes, with study 5 only having four participants in their primary interviews, but study 3 had the most participants with a total of forty-four parents and children completing interviews. Studies also used non-interview-based data, which enabled them to conduct relevant analysis and achieve coherent conclusions. Studies (1,4,5 & 5) used naturalistic methods of data collection such as researcher participation and/or observation, and study 5 also reviewed local media coverage as part of data analysis. In addition to using naturalistic methods of data collection, study 1 also used associative imagery techniques to facilitate interviews and increase the data collected during the interview.

Methods were qualitative, but across all studies, authors reflected on the dearth of qualitative research in this area, particularly compared to qualitative research in 'green spaces'. Individual interviews were used as a data collection method in all six studies on account of the research area being exploratory and novel. Ethnographic

methods were adopted in four of the studies; study 4 was conducted as a focused ethnography that encompassed observer participation in ocean swimming and in-person interviews with ocean swimmers in Perth, Australia. Study 5 used an ethnographic approach and engaged in researcher participation at two sites in Ireland over a two-year period. Utilising the same ethnographic approach, study 6 visited three sites in Northern Ireland, engaging again in researcher participation, taking photos and field notes but over a longer period of three years. Study 4,5 and 6 used the shared experiences and relationships that the researchers built with people and places formed over time to facilitate interviews. Study 1 created shared experiences of accompanying elderly participants in taking photos of blue spaces on Waiheke Island, New Zealand and utilised photo-elicitation techniques to facilitate discussion in participant journals and to illustrate remarks made in interviews. Study 2 used visual cues from Geo maps (created by a GPS tracking system the participants had worn for a week) to enquire about participants experiences of specific blue spaces. Study 3 completed semi-structured interviews with multiple family members and was the only study in this review that included children in the sample.

Whilst there was generally an even distribution across studies regarding gender, there was a noticeable skew in the socioeconomic demographics of participants in that studies had mostly upper/middle-class individuals in their participant sample (this was either demonstrated in demographic data included in the data set or inferred by the author of this review based on data such as being able to afford residential care and a dwelling with an ocean view). Whilst socioeconomic status was not a specific inclusion criterion for any of the studies recruitment strategies; it echoes findings in other

research questioning the accessibility and use of local blue spaces for people of lower socioeconomic status (Bell et al., 2017; White et al., 2020).

Data Analysis

The most common data analysis method used in the literature was thematic analysis, used by five out of 6 of the studies (2,3,4,5,6). Study 1 used an Interpretative phenomenological analysis (IPA) approach.

Studies generally utilised a thematic approach (TA). Whilst TA provided flexibility, which is useful in exploratory research, it has been criticised as flexibility can lead to inconsistency and limit coherence when establishing themes from the data (Holloway & Todres, 2003). However, in relation to the studies included in this review, all themes were coherent and related closely to the study aims and research questions. Study 1's use of an Interpretative phenomenological analysis (IPA) approach felt appropriate in the context of the novel and exploratory subject area as it allowed the researchers to uncover 'deep' information and perceptions from the data and supported the interpretation of meanings, feelings and experiences that the participants themselves may not have been aware of. The primary concern about approaches using phenomenological analysis is the inference made by researchers of meaning based on participant language. However, study 5 described events where participants experiences were beyond words. For example, despite the regularity of their engagement in ocean swimming, participants found it 'difficult' to articulate their experiences. The researchers shared experience of ocean swimming allowed for an informed interpretation of such accounts in that when participants did not have the

words, the researcher ‘got it’. This suggests that IPA may be an underused and helpful methodology for future research in this area.

Main Findings and Implications

Common themes amongst those drawn out by the papers’ authors were identified and are discussed below. The themes were: Indirect and Intentional Exposure to Blue Space, Perceived Physiological Health Benefits of Blue Space, Perceived Psychological Health Benefits of Blue Environments, Blue Space and social Health and, Blue Space and Health Risks.

Indirect and Intentional Exposure to Blue Space

The type of exposure to blue spaces, indirect (i.e., view from a window) and intentional (i.e., choosing to go for recreation/work), was suggested to have an impact on health outcomes. Study 1 described how many participants described engaging both intentionally and indirectly with blue spaces. They noted that participants reported indirect exposure as being part of daily routines (e.g. interacting with views of the sea). Researchers felt this daily, routine indirect exposure to blue coastal spaces helped participants establish a sense of familiarity and security. They particularly noted that views from participants homes afforded a safe distance from the physical challenges of engaging more intentionally with blue spaces.

The other five studies focussed more explicitly on experiences resulting from intentional exposure. Study 3 found that parents play a key role in enabling their children to visit blue spaces. Studies identified that exposure to blue spaces in childhood was linked to a lifelong intentional utilisation of blue spaces and to blue space having benefits to mental, physical and social health (1,2,4,5,6).

Perceived Physiological Health Benefits of Blue Space Exposure

All studies reported findings related to blue space and physiological health. Participants credited blue spaces as positively impacting their physiological health in a number of ways, such as; supporting the maintenance of healthy weight and blood pressure (4), maintaining or improving their fitness and general health (1,2,3,4,5,6), minimising or preventing the need for medication (4), and assisting with general health issues (1,4,5,6). Study 1, 2 and 3 commented more generally on exposure to blue coastal spaces, where study's 4,5 and 6 were focused on health in relation to swimming in blue coastal environments.

There was a consistent perception that exposure to blue space was linked to physiological health benefits throughout the life-course; in children, adults and older adults. Only one study (3) included children in its sample, and findings indicated that families perceive beach visits as having physical health benefits for both children and parents. Participants in study 3 claimed that blue spaces encouraged them (families) to be physically active as they afforded an opportunity for physical recreation and play.

Three of the studies focussed on the physical activity of wild/open ocean swimming (4,5,6). All found that swimming in natural blue space was perceived as an appealing low-impact outdoor exercise, available when engaging in other forms of physical activity was prevented by age, injury, and health concerns. In addition to supporting the development and maintenance of health, study 6 suggested that the dichotomy of a 'healthy' and "unhealthy' body may not be a fixed construct. The study builds on ideas in study 5 that unhealthy 'land' bodies can act as healthy 'water' bodies when swimming in some blue spaces. For example, the author of study 5 and 6

commented on the negative impact of being overweight on land and the challenges this poses. The study highlighted that being overweight in cold water sea swimming affords advantages to the swimmer as it allows one to remain in the water longer and swim further when compared to a person whose land body is a ‘healthy’ weight.

Perceived Psychological Health Benefits of Blue Space Exposure

Studies 1, 2, 5 and 6 acknowledged cultural narratives regarding the psychologically healing potential of general and specific environmental features in blue spaces. Study 2 explicitly comments on a longstanding cultural perception of water as ‘cleansing’ or ‘purifying’, which was mirrored in participants responses which indicated that they felt calmer by the sea, referring to the cleansing nature of the waves in the context of their emotions.

The primary health benefits perceived by parents and children accessing blue coastal spaces in study 3 were identified as being psychological. Having fun and ‘stress relief’ were highlighted key benefits (3). Study 2 also noted that participants reported multiple psychologically beneficial consequences linked to blue space exposure, such as the ability to ‘switch off from the day-to-day’, ‘lose themselves’ and/or gain a sense of perspective. Study’s 4, 5 and 6 with open-water ocean swimmers identified that the physical practice of swimming provided psychological respite from everyday stressors. Participants in study 4 reported their swimming practice as being equivalent to a drug or medicine for their mental health.

Study 1 and 2 found that blue space exposure has a therapeutic impact on psychological health due to its links with personal challenge, purpose and

achievement/growth, which are noted in study 2 as being important components of eudaimonic wellbeing (experience of life having purpose).

Findings also noted that a psychological outcome of blue space exposure is linked to experiences of ‘grounding’ (1,2,5,6). For example, study 6 notes that water could be destabilising in a kinaesthetic sense, yet one participant noted that at times of stress, ‘when it feels like there no solid ground to put your foot down, the sea is that for me’. Similarly, study 1 explored how the ocean’s ‘larger than life’ character can help ‘put things into perspective’ and be an anchoring experience; ‘troubles can seem less significant, and a settled sea can calm the inner waters of the human spirit’.

Blue Space Exposure and Social Health

All studies identified that blue spaces facilitate social connection. Study 2 found themes associated with the unique social dynamics available in blue coastal space for people (a) seeking friendly conversation and a convivial atmosphere; (b) engaging in varied opportunities for family leisure and wellbeing available in blue spaces, and (c) connecting through shared hobbies and experiences. Study 1 highlighted that whilst living on an island can result in a feeling of social isolation due to the separateness of its geography, the social bond of a shared ‘islandness’ identity served to facilitate a sense of community and social connection. Feeling part of a community was facilitated by unique bonding opportunities afforded in blue spaces, which were also noted as impacting peoples physical and psychological health (4).

There was a mutual agreement in the literature that social contact is an important but complex mechanism in facilitating therapeutic interactions with blue space. The studies suggest that coastal spaces become therapeutic through repeated and

shared/social experiences, specific to different life events and stages. Many of the studies found that memories of meaningful relationships and social encounters were discussed during participant interviews (1,3,4,5,6). Study 1's chosen population was older adults. Participants described the reflective surface of the ocean as providing a symbolic reflection of one's life, perhaps re-awakening memories of important relationships and engagement with/in blue spaces. Study 2 and 3 found that blue coastal environments were important in promoting family wellbeing, particularly for those with younger children, as these environments met the needs of both parents and children, providing unique opportunities for play and social/family interaction (3).

Study 6 described the therapeutic benefits of blue spaces as an 'accretive process' as memories of meaningful experiences both near and in the ocean shared with other people and throughout one's lifetime build up a 'dimensionality' and create a 'deep' experience of such places. Participants in study 1, 2,3,4,5 and 6 recalled positive memories about social connectedness in relation to blue spaces.

Health Risks and Blue Space

Whilst all studies reported many health benefits for blue space exposure, study 6 acknowledged that as well as enabling human movement, water can also disable it. Though not the focus of any of the studies, study 1,4,5 and 6 recognised the health risks associated with using blue spaces. Study 4 researched the experiences of swimmers in Perth, where waters are notorious for sharks which present an obvious health risk. Study 5 and 6 recognised the risks associated with being in cold and turbulent ocean water, such as drowning and hypothermia. With regards to cold water, study 5 highlighted how technologies (such as wet-suits) could mitigate risks associated

with being in cold open water, but they recognised a tendency for ocean swimmers to shun such technologies. Both studies 5 and 6 suggested that this may be due to an interaction between risk and enjoyment. They hypothesised that participants awareness of risk was central to 'therapeutic' experiences of blue spaces and that the fear of such risk results in the sense of respect for the ocean. Study 6 concluded that risk and joy could be simultaneous outcomes of a therapeutic blue space experience.

White et al. (2020) highlighted that ultimately, whether interacting with blue spaces is good for health and well-being will depend on weighing up the risks with the benefits discussed. Risks related to blue space exposure are well documented in previous research, which gives a rationale for the qualitative studies in this review, mostly negating an in-depth exploration of risk (Borja et al., 2020). Some studies mentioned more novel risks specific to certain geographical locations, such as the risk of swimming in water inhabited with sharks mentioned by study 4. Considering a risk/health benefits trade-off remains difficult, especially when studies suggest that risk may be an integral part of experiencing the therapeutic benefits of blue space.

Discussion

The aim of this review was to understand what qualitative research has been published relating to people's autonomous use of blue space and the relationship exposure has to health outcomes. All six studies aimed to fill the gap in qualitative literature regarding the interaction between blue space and aimed to understand its therapeutic effects on human health. Four of the six studies responded to the call for more naturalistic research utilising phenomenological methodologies (1,2,4,5,6) (Völker

& Kistemann, 2011). Despite the decade that has passed since this paper's publication, there remains a clear paucity of literature in this area. Thus, the topics discussed and themes identified in the present review were quite broad and all studies included were only in relation to 'coastal' blue spaces and did not include other fresh water blue spaces such as lakes and rivers highlighting a gap in the literature base. Overall, the six studies included in this review scored highly against the CASP criteria (lowest score of 7/10), indicating that whilst studies are lacking in quantity, the existing literature base is of good quality.

Although the biopsychosocial themes are separated thematically in this review for pragmatism, there are clearly many complex interactions between psychological, social, and physiological health and blue space. However, there was a universality in that positive mental health and wellbeing outcomes were perceived as the primary benefit of blue space exposure in each paper. Immediate feelings of rejuvenation, enjoyment and reduced stress were frequently described along with more preventative or Salutogenic benefits as highlighted by the suggestion of 'accretion' and the build-up of resilience over time (6). It remains unclear how blue space exposure might prevent or mediate mental health difficulties as studies focus primarily on the relationship between blue space and mental wellness as opposed to illness. Conversely, papers in this review did explore the relationship between blue space and 'poor' physical health, which highlighted nuanced differences between the experience of blue spaces in the general population and in people with physical health differences. Blue spaces afford diverse and inclusive opportunities for exercise, improving physical health in all ages and across abilities, but they also challenge the social construct of healthy and unhealthy bodies,

which could impact self-esteem. Sociometer theory (Leary & Baumeister, 2000) suggests that self-esteem motivates adaptive behaviour and thus challenging social constructs of healthy bodies through inclusive opportunities for exercise also challenges the stigmatizing ideas around the social eligibility. The impacts this has on self-esteem may be responsible for an individuals motivation to continue engagement with blue spaces allow the possibility of experiencing the consequent biopsychosocial health benefits associated with this, such as increased quantity and quality of people's interpersonal relationships, which further reinforce improved self-eseem and increased motivatin to engage in blue spaces.

Connectedness to place and people was highlighted as being important in enabling therapeutic blue space experiences. It is unsurprising that social connectedness was an important aspect of blue space experiences as an innate human need for meaningful relationships has been long established (Mathes, 1981). Loneliness is a major contributor and maintaining factor in mental health difficulties; however, it is unclear from the reviewed papers whether the connection to place and people in blue space mitigates the effects of loneliness and mediates the impact it has on mental health difficulties (Cacioppo & Patrick, 2008).

When considering why the papers in this review, and within the wider literature base, describe a positive relationship between blue space and health, it can be thought of in terms of what motivates us more generally. Maslow's hierarchy of needs and theory of motivation suggests that belongingness, esteem, and self-actualisation are key to human motivation, and thus the biopsychosocial benefits of blue space exposure described in this review could explain the longstanding human desire to be in or near

these environments and the general perception that blue spaces have multifaceted benefits to our health (Maslow, 1981).

Limitations & Future Research

It is clear that blue spaces have a multidimensional value in the promotion of people's health, but in order to reduce health inequalities, more needs to be understood about the needs and experiences of more specific populations (i.e., those with mental health difficulties and those from lower socioeconomic demographics) (WHO, 2019). Research involvement from clinical psychology could bring a valuable perspective, particularly in relation to incorporating theory and practices related to mental ill-health, to an area that is currently led by other disciplines and specialisms.

Connectedness to blue space was discussed in all studies as participants described specific setting characteristics which were escribed as being important in achieving positive outcomes. The studies included in this review consider only the relationship between experiences of **coastal** blue spaces and health outcomes. Qualitative research considering other blue spaces could highlight nuanced differences and similarities in the ways various blue spaces are experienced as relating to health outcomes, particularly in the different characteristics of alternative blue spaces (i.e., different sensory experiences).

Finally, more research is needed with people who dislike or do not perceive blue space to influence their heath to counter the current focus on more positive perceptions of blue spaces.

Implications for Clinical Practice

Prevention is a key strategy in tackling increasing levels of mental and physical ill health and reducing the financial strain on the NHS, a strain that has been exacerbated by the global COVID-19 pandemic (Pouso et al., 2021; Astell-Burt & Feng, 2021). The British Psychological Society (BPS) Public Health and Prevention Subcommittee promotes awareness, innovation, and practice in preventative work within the clinical psychology community. This review suggests that blue spaces can be used not just to treat illness but to a Salutogenic effect, promoting good psychological health. This suggests that the BPS and other psychological bodies should consider the potential preventative role blue space could play when innovating preventative interventions at an individual and policy level.

The research reviewed in this document suggests that exposure to blue spaces (both intentionally and indirectly) could play a role in tackling some major public health challenges, which could have implications for professionals working clinically, particularly those working in coastal communities (Grellier et al., 2017). It could be used by clinical psychologists to help individuals with chronic health conditions manage their rehabilitation, recovery, or ongoing health states. It could also have implications for psychologists working in mental health settings. Although the understanding and generalisability of the mechanisms through which the benefits of blue space exposure influence mental health difficulties remains unclear, this review suggests that blue space does seem potentially useful in supporting resilience, improving self-esteem, and mitigating the effect of loneliness through connection not only to people but also places (Tester-Jones et al., 2020).

Conclusion

This review has explored the qualitative literature base regarding the non-interventional experiences and recreational use of blue space with a focus on further understanding how these natural environments influence health outcomes. Although the literature is sparse, it covers several clinically relevant themes, including experiences of blue space exposure as being psychologically, socially, and physically beneficial, in addition to a nuanced discussion of how these benefits are entangled with risk. This review highlights that people are intrinsically motivated to engage with blue space and are conscious of the multifaceted benefits that blue space exposure can have on human health. Suggestions are made regarding implications for clinical practice at an individual and policy level. Future research should further consider the experiences of more specific populations such as those from different socioeconomic backgrounds, ethnicities, and lived experience of mental health difficulties, as these demographics were noticeably absent from the current literature base.

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Appendix A: Search Terms for Databases

Search Terms for Ovid Databases.

	Keyword	Alternative words (combined with OR with the keyword)
Section 1	**outdoor blue spaces**	blue space* OR river* OR lake* OR sea OR beach* OR fountain* OR riparian OR ocean* OR coast*.
Section 2	**physical and mental health**	mood disorder* OR depress* OR anxiety OR anxious OR obsessive-compulsive dis* OR stress OR mental health OR mental disorder* OR psychological well-being OR mental wellbeing OR social well-being OR cognitive function* OR health OR cardiovascular disease* OR heart disease* OR blood pressure OR hypertension OR obesity OR overweight OR weight OR body mass index OR BMI OR OCD
Section 3	**qualitative style analysis**	Qualitative OR phenomenological OR discursive OR discourse OR grounded theory OR thematic analysis OR conversational analysis OR IPA OR narrative OR interview*
Search Combined	Section 1 AND Section 2 AND Section 3	

Search Terms for EBSCO Databases.

	Keyword	Alternative words (combined with OR with the keyword)
Section 1	**outdoor blue spaces**	"blue space*" OR river* OR lake* OR sea OR beach* OR fountain* OR riparian OR ocean* OR coast*.
Section 2	**physical and mental health**	"mood disorder*" OR depress* OR anxiety OR anxious OR "obsessive-compulsive dis*" OR stress OR "mental health" OR "mental disorder*" OR "psychological well-being" OR "mental wellbeing" OR "social well-being" OR "cognitive function*" OR health OR "cardiovascular disease*" OR "heart disease*" OR "blood pressure" OR hypertension OR obesity OR overweight OR weight OR "body mass index" OR BMI OR OCD OR trauma*
Section 3	**qualitative style analysis**	Qualitative OR phenomenological OR discursive OR discourse OR "grounded theory" OR "thematic analysis" OR "conversational analysis" OR IPA OR narrative OR interview*
Search Combined	Section 1 AND Section 2 AND Section 3	

Search Terms for Pub Med Databases.

	Keyword	Alternative words (combined with OR with the keyword)
Section 1	**outdoor blue spaces**	"blue space*" OR river* OR lake* OR sea OR beach* OR fountain* OR riparian OR ocean* OR coast*.
Section 2	**physical and mental health**	"mood disorder*" OR depress* OR anxiety OR anxious OR "obsessive-compulsive dis*" OR stress OR "mental health" OR "mental disorder*" OR "psychological well-being" OR "mental wellbeing" OR "social well-being" OR "cognitive function*" OR health OR "cardiovascular disease*" OR "heart disease*" OR "blood pressure" OR hypertension OR obesity OR overweight OR weight OR "body mass index" OR BMI OR OCD OR trauma*
Section 3	**qualitative style analysis**	Qualitative OR phenomenological OR discursive OR discourse OR "grounded theory" OR "thematic analysis" OR "conversational analysis" OR IPA OR narrative OR interview*
Search Combined	Section 1 AND Section 2 AND Section 3	

Appendix B: Critical Appraisal Skills Programme (CASP) Checklist

Screening Questions	Answer
Q1 Was there a clear statement of the aims of the research? HINT: Consider • What was the goal of the research? • Why it was thought important? • Its relevance	Yes / No/Can't tell
Q2 Is a qualitative methodology appropriate for the authors' stated aims? HINT: Consider • If the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants • Is qualitative research the right methodology for addressing the research goal?	Yes / No/Can't tell

Is it worth continuing?

Q3 Was the research design appropriate

address the aims of the research? Yes / No/Can't tell

HINT: Consider

- If the researcher has justified the research design (e.g. have they discussed how they decided which method to use)

Q4 Was the research design appropriate to address the aims of the research? Yes / No/Can't tell

- If the researcher has justified the research design (e.g. have they discussed how they decided which methods to use?)

Q5 Was the data collected in a way that addressed the research issue? Yes / No/Can't tell

HINT: Consider

- If the setting for data collection was justified
- If it is clear how data were collected (e.g. focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
- If the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews were conducted, or did they use a topic guide)?
- If methods were modified during the study. If so, has the researcher explained how and why?
- If the form of data is clear (e.g. tape recordings, video material, notes etc.)
- If the researcher has discussed saturation of data

Q6 Has the relationship between researcher and participants been adequately considered? HINT: Consider • If the researcher critically examined their own role, potential bias and influence during (a) Formulation of the research questions (b) Data collection, including sample recruitment and choice of location • How the researcher responded to events during the study and whether they considered the implications of any changes in the research design	Yes / No/Can't tell
Q7 Have ethical issues been taken into consideration? HINT: Consider • If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained • If the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study) • If approval has been sought from the ethics committee	Yes / No/Can't tell
Q8 Was the data analysis sufficiently rigorous? HINT: Consider • If there is an in-depth description of the analysis process • If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data?	Yes / No/Can't tell

- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
- To what extent contradictory data are taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

Q9 Is there a clear statement of findings? Yes / No/Can't tell

HINT: Consider

- If the findings are explicit
- If there is adequate discussion of the evidence both for and against the researchers arguments
- If the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)
- If the findings are discussed in relation to the original research question

Q10 How valuable is the research?

HINT: Consider

- If the researcher discusses the contribution the study makes to existing knowledge or understanding e.g. do they consider the findings in relation to current practice or policy?, or relevant research-based literature?
- If they identify new areas where research is necessary
- If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used

SCHOOL OF PSYCHOLOGY

DOCTORATE IN CLINICAL PSYCHOLOGY

EMPIRICAL PAPER

"My best card against my mental health": A Qualitative Analysis of Blue Space and The Self-Management of Mental Health Symptoms.

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Target Journal: Health & Place

Word Count: 8269 words (including abstract, table of contents, list of figures, references, footnotes, appendices)

Submitted in partial fulfilment of requirements for the Doctorate Degree in Clinical Psychology, University of Exeter

Abstract

Objective: Theoretical and empirical evidence suggests a relationship between exposure to blue space (outdoor water environments) and positive mental health and wellbeing. To date, studies indicate that people's proximity to and use of blue space is associated with good mental health, but additional exploratory research is required to understand interactions between blue space and mental health outcomes in people with mental health difficulties. This study explores how people with mental health difficulties experience blue spaces in a non-clinical, non-intervention context. A broader aim of this research is to consider the mechanisms/pathways connecting blue space and mental health outcomes.

Methods: The population of interest in this study were adult men and women living in British coastal communities who self-identified with having a mental health difficulty. Data consisted of semi-structured interviews from primary (*N=6*) and secondary (*N=7*) data sets. The data was analysed using constructivist grounded theory.

Results: Findings indicate that blue spaces provide conditions where people can gauge their mental health, assess their needs, and get them met. The analysis highlighted that

blue space exposure has both a reactive and preventative impact on mental health symptoms and suggested that this may be mediated by the severity of mental health difficulties. This study supports the notion that social (i.e., meaningful relationships with others) and attentional (i.e., mindfulness and gratitude) mechanisms are important in explicating the relationship between blue space and mental health but highlights occasions where blue space exposure can worsen (i.e., heightened anxiety related to the perception of threat from others on beaches at night) or have no effect on mental health symptoms (i.e., the persistence of suicidal ideation).

Conclusion: Overall, this study suggests that an added value of blue space environments specifically for people living with mental health difficulties is that they provide the necessary conditions that empower people to feel able to self-manage their mental health symptoms.

Introduction

Blue Space

Natural environments are increasingly considered crucial settings for health promotion (Grellier et al., 2017). Multiple large scale epidemiological data sets have identified the positive influences that exposure to natural environments can have on physical health, mental health, and self-reported wellbeing (Gascon et al., 2017; Britton et al., 2020). Natural environments can be categorised as green spaces (i.e., forests, woodlands) or blue spaces (i.e., beaches, lakes). In the context of global concerns about mental and physical health, there has been growing research and policy interest over the last 40 years around the importance of natural environments for health

promotion (Frumkin et al., 2017). The focus has been on green spaces; however, the evidence base for blue space is growing (White et al., 2020; Foley et al., 2019). Causal pathways through which green may directly or indirectly influence mental health are the foundation upon which blue space research is now building. Physical activity, social opportunity and sensory stimuli have been well documented in green space literature however, generalising them in a concrete way raises obvious issues as blue spaces are likely to offer different physical opportunities (such as swimming), different social opportunities and different sensory stimuli (Nutsford et al., 2013; White et al., 2020). Blue spaces are also likely to pose different risks to health such as risk of drowning. Given these potential differences, it is important that whilst the pathways may be the same, the mechanisms within them may be quite different and need to be further understood.

A re-discovery of water within wider public health is evident in the promotion of coasts, rivers, and lakes as spaces of leisure, exercise and recovery (Andrews & Kearns, 2005; Thompson-Coon et al., 2011). While blue space is a relatively new and under-researched concept within clinical psychology, it is more frequently referenced within the context of a therapeutic landscapes model in health geography literature describing the role of everyday landscapes in improving human health (Gesler, 1992). For many decades, people have anecdotally associated blue spaces with healing and wellbeing (Foley et al., 2019; Hansen-Ketchum et al., 2011). Today, blue spaces remain a frequent feature among people's favourite places to visit for restoration and relaxation (Korpela et al., 2014).

Research by the Blue Gym project in the South-West of England has documented the positive impact of blue space on citizen health and wellbeing (Depledge & Bird, 2009, White et al., 2010, Wheeler et al., 2012). Despite this, Britain's coastal communities are among the country's worst-ranked parts of the UK across various economic and social indicators, including health (Corfe, 2017). Many factors explain this discrepancy, including low employment opportunities, geographical isolation, lack of mental health and recreational facilities and services (White et al., 2013). However, once these confounds have been controlled for, coastal visits have been found to mitigate the effects of deprivation and mental health as people still experience better mental health when they are living close to the ocean (Depledge & Bird, 2009; Garret et al., 2019).

Although research in this area remains relatively embryonic, recent literature has begun to question the mechanisms and pathways by which blue spaces influence positive mental health and wellbeing (White et al., 2013, White et al., 2020).

Mental Health and Blue Space

According to NICE, mixed anxiety & depression is the most common mental disorder in Britain, with 7.8% of people meeting diagnostic criteria (Clark, 2011). An estimated 4-10% of people in England will experience depression in their lifetime (McManus & Meltzer et al., 2009). Particularly due to the burden that anxiety and depression represent in our society, health outcomes are starting to be evaluated in relation to natural outdoor environments (Dempsey et al., 2018; WHO, 2019). But few qualitative studies exist which have explored experiences of recreational use of blue space, and none have explored this in people with mental health difficulties (White et

al., 2020, Britton et al., 2020). Two key theories have been linked to the relationship between exposure to natural environments and mental health; attention restoration theory (ART) and psychophysiological stress recovery theory (PSRT) (Kaplan& Kaplan., 1989; Ulrich et al., 1991).

ART predicts that exposure to natural environments may lead to improved cognitive performance through restoration. Attention can be split into two components: involuntary attention, where attention is captured by inherently intriguing stimuli (i.e. noticing the sound of a wave, noticing a change in the breeze), and voluntary or directed attention, where attention is directed by cognitive-control processes (i.e. ruminating on thoughts, planning your day) (Kaplan & Kaplan.,1989). Through the invocation of involuntary attention responses, the limited cognitive resource of directed attention can be restored (Stevenson, Schilhab, & Bentsen.,2018). Stevenson et al.'s (2018) systematic literature review concluded that working memory, cognitive flexibility, and attentional control are improved after exposure to natural environments.

Psychophysiological stress recovery theory (PSRT) proposes that restoration can occur when a scene elicits feelings of mild to moderate interest, pleasantness, and calm (Ulrich et al., 1991). It has been proposed that whilst viewing nature, positive affect replaces negative affect resulting in lower physiological arousal (Berto., 2014). Clark's cognitive model of panic highlights that physical symptoms of anxiety (e.g. muscle tension, restlessness, palpitations, shaking) are key components in maintaining the condition (Clark, 1986). The specific relationships between blue space, PSRT and anxiety are not yet empirically established, but theoretically, it could have important clinical implications for working with people who experience anxiety.

Both theoretical positions can be linked to mechanisms of change targeted by various therapeutic models of psychological intervention. For example, third-wave CBT approaches such as mindfulness-based cognitive therapy (MBCT) and compassion focussed therapy (CFT) promote alterations in worry, rumination, and compassion through using techniques that facilitate connection to the present moment and environment (Choe, Jorgensen & Sheffield, 2020). These models are one of the few areas of clinical psychological practice where there has been an effort to incorporate nature to enhance outcomes (Schuling et al., 2018; Roesner et al., 2013). Studies indicated alterations in attention and emotional reactivity as treatment outcomes. However, most of this literature is relating to the use of green spaces thus generalising these mechanisms and treatment outcomes to blue spaces remains premature, particularly when generalising to divergent populations such as those with mental/physical health difficulties (Vert et al., 2020).

When considering a clinical intervention for a mental health condition, previous research has explored how blue spaces can augment current therapeutic models (blue care); conclusions have been mixed with both positive and weak associations being identified between blue care and health and wellbeing indicators (Britton et al., 2020).

Mechanisms have been suggested such as increased physical activity and social interactions but experiences of individuals living with a mental health condition have not been researched in a non-interventional context. Given the evidence of the overall positive impacts of blue space on mental health, it is important to establish an understanding of how blue spaces are currently used and experienced by people with

mental health difficulties in a non-interventional context. This can then inform the development of interventions for mental health that seek to use blue space.

Research Aims

While there is emerging evidence for a positive relationship between blue spaces and mental health, there is limited qualitative research in this area. Further, no known qualitative studies investigate the experience of accessing local blue spaces in people who have experienced mental health difficulties (refer to the literature review in this thesis).

This study explores how people with mental health difficulties experience blue spaces in a non-clinical, non-intervention context. A broader aim of this research is to consider how a model could be established to connect blue space and mental health, developing a further understanding of the specific mechanisms/pathways involved.

Research Questions

This research is guided by the following questions:

1. How do people with mental health difficulties use local coastal environments, and how is this related to their mental health symptoms?
2. Through what mechanisms/pathways does blue space interact with mental health?

Methodology and Study Design

Research Methodology

Due to the nascent nature of the area, this research was an explorative design using a constructivist grounded theory (GT) methodological approach (Charmaz, 2014). The researcher sought to explore how people subjectively understood and made sense

of their experiences of blue space and mental health (Andrews, 2012). GT begins with an empirical phenomenon (the experience of blue space by people with mental health difficulties) and abstracts from this (through the identification and interpretation of patterns in the data) to create statements that can be verified by the data (Charmaz, 2014).

Rationale for Methodology

There are two reasons why I chose constructivist GT :

• My research is within an area where there is minimal existing research and theory, so I was keen to develop theory.

• Living in a coastal region of the UK and hearing/reading many anecdotal accounts of the therapeutic encounters with coastal spaces, I felt that I had developed a preconceived position and expectation for the outcomes of this research. Because of this, I needed to choose a methodology that embraced reflexivity as part of the process, and pay attention to that, so that I could explore new discoveries and tease them out and not just stick to what I already knew. I wanted to bring rigour to my approach in this study and not make assumptions.

Research Design

The researcher used and moved through the processes outlined by Charmaz (2014) (see figure 1). As a research process, GT is fluid with a constant ebb and flow between data collection with data analysis. In a tidal fashion, the researcher went to and fro between stages, after which the findings, analysis and theory building were combined.

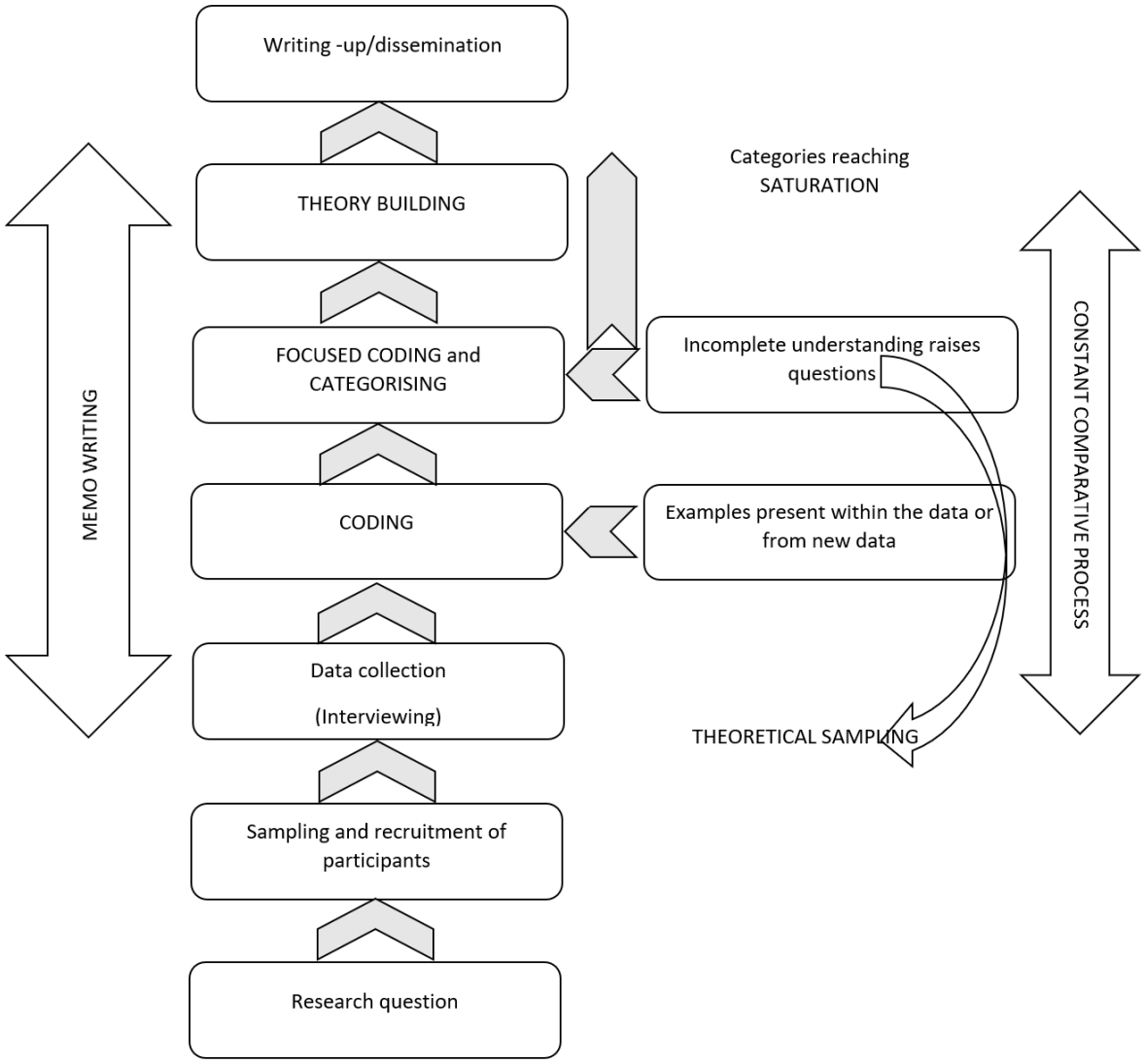

Figure 1. A visual representation of the stages and processes within grounded theory that were followed in this research (Tweed and Charmaz, 2012 in Charmaz, 2014, p.18)

Recruitment, Secondary Data and Sampling of Participants

Participants and Inclusion Criteria.

The population of interest in this study were adult men and women living in British coastal communities who self-identified with having a mental health difficulty. It

was not feasible to check the diagnostic status of participants within the ethical and pragmatic constraints of this research; thus, participants did not need to have a clinically verified mental health diagnosis. Therefore, adults who have a confirmed current or historical diagnosis of anxiety and or depression, adults currently involved with mental health services both with or without a mental health diagnosis, or those who have historically had support from mental health services and who identify with having mental health difficulties but did not receive a formal diagnosis were all included.

There were seven participants in the secondary data set, and a further six recruited specifically for this study with a total of 13 participants (Table1). For context, the six participants recruited specifically for this study were interviewed during a lockdown which was enforced by the UK government in response to the Coronavirus pandemic.

Table 1.

Sample demographic characteristics (primary data)[2]

Participant Number	Age	Gender	Employment Status	Mental Health Difficulty
8	59	M	Retired	Anxiety
9	47	F	Employed	Depression & Anxiety
10	40	F	Employed	Anxiety & Depression

2 Secondary data not included in table as transcripts were anonymised by previous researchers therefore it was not possible to ascertain demographic's for these 7 participants.

Participant Number	Age	Gender	Employment Status	Mental Health Difficulty
11	26	F	Voluntary Work	Anxiety & Depression
12	26	F	Employed & Student	Anxiety, Panic Disorder
13	24	F	Employed	Anxiety

Within the context and limitations of a clinical psychology doctoral thesis, a relatively small sample size of thirteen participants meant that a point of theoretical saturation was not reached, but further recruitment was not possible (Urquhart., 2013).

This research was altered significantly due to the onset of a global pandemic interrupting recruitment plans. The researcher's pre-pandemic intention was to conduct purely primary research with follow up interviews to gather data on emerging themes that required further exploration. Unfortunately, this was not possible during the early stages of the national lockdown thus an approach was adopted utilising secondary data for the first stage of analysis with primary data being used only for the second stage of analysis.

Secondary Data

The secondary data were collected as part of a Wellcome Trust funded public engagement project (REFLECT). The project aimed to gain a greater understanding of how mental health interacts with blue spaces in individuals living in two coastal communities. Data from seven participants with a lived experience of mental health difficulties living in and around Bude in Cornwall was collected by researchers working on the project through one-to-one interview. Participants used for these interviews gave

consent for other researchers to access the data, which allowed for the incorporation the data into the current study. Prior to this study, the data had not been analysed for research or academic purposes and had been solely used for an art installation.

Recruitment

The second set of participants were recruited via social media (Facebook) (Appendix F). When people expressed interest based on the online advert, contact details were sought, and participants were contacted with further, detailed information about participation (consent, participant information sheet) (Appendix A & B). Upon receipt of a signed consent form, an online interview was arranged, and a link was sent from the researcher to confirm this.

Situating the Researcher/ Reflexivity

A reflexive stance was held throughout, and how my position, interests' biases, and assumptions influenced my interaction with the data was deeply and consistently considered (Hall & Callery, 2001). Memos were completed throughout detailing my interaction with the research questions and position in relation to the data (Appendix C). Here I am transparent about my perspective, roles and interests in relation to the research topic.

I am a white, female, middle-class trainee clinical psychologist in my late twenties. I was born in a landlocked county and moved to a coastal location 6 years ago. Since this move, blue spaces have become a central part of my daily life, being the primary space used for recreation, social interaction and exercise. I was interested in this research area as I personally experienced (and continue to experience) many

therapeutic benefits of blue space exposure, and I utilise these spaces regularly to support my mental health.

Living in a coastal area, I have had many casual conversations, both prior and during the research process, with local friends and family about their interactions with blue spaces. I also, having worked clinically for six years in a coastal county, have heard regular accounts of patient interactions with blue spaces in relation to their mental health and been witness to the outcomes. I have noticed this as being a key difference in the way people manage their mental health (a different coping strategy) in this part of the UK in comparison to clinical work I have completed in landlocked counties.

In summary, I had prior awareness of how locals use such spaces, an obligation to fulfil academic criteria as part of the doctorate in clinical psychology dictating that the research area has to be clinically relevant to the discipline, personal experience and exposure to narratives of people experiencing blue spaces therapeutic and a sense of what stops/facilitate people using such spaces. All these aspects could have had an influence on the research question and data analysis.

Procedure

Ethical Considerations

The current study was approved by the Psychology Research Ethics Committee, College of Life and Environmental Sciences, the University of Exeter, on 01/12/2020 (Appendix H). Within this, ethical approval was granted for the use of the secondary data.

Risk

For this project, several risks were considered. Risks regarding respect of confidentiality and anonymity of participants, potential loss of data, participants' emotional distress associated with the study, feasibility and general management of the project and availability of adequate resources were also considered. The Exeter Mood Disorders Centre (MDC) risk protocol was used to understand and respond to risk (Appendix D). A signposting sheet was provided at the end of the interview (Appendix G).

Informed Consent

Written and verbal informed consent was obtained from all participants. The participant information sheet was attached along with the consent form (Appendix A & B) and was returned prior to arranging the interview. Consent was also re-requested verbally at the beginning of each interview.

Interview Process

The researcher interviewed 6 participants via video link using Zoom video conferencing software. Participants were first asked a series of demographic questions, which was followed by a semi-structured interview (Charmaz, 2014) (Appendix E). Interviews lasted on average 40 minutes, were recorded, transcribed verbatim and anonymised.

Analysis Procedure

Data was coded by listening to interviews and simultaneously coding transcripts using NVIVO-12 (QSR, 2020).

Phase 1

In the first stage of the analysis, primary/initial codes were created from the secondary data. Primary codes were coded in vivo to remain close to the participant's own words (Charmaz, 2014).

The analysis then moved onto focused coding; the primary codes were combined under common themes. The researcher summarised the emerging themes in paragraphs supported by extracts from the data (Bazeley, 2009). Analysis was guided by core questions outlined by Charmaz (Charmaz 2014, p. 140). The researcher considered questions such as the link to the research question, how the category related to existing mental health/blue space theories, how the theme linked to other themes/data and whether anything would be lost if the theme was discarded.

Throughout, the researcher stepped back to write memos at various points such as following interviews, during analysis and when transcripts were revisited. The style of writing in the memos kept the free-flowing form suggested by Charmaz (2014)(Appendix C).

There was a pause between the analysis of secondary data and recruitment/interviews to enable theoretical sampling, as is shown in Figure 1 (Tweed & Charmaz, 2012). Theoretic sampling is an important aspect of GT methodology whereby the researcher reviewed different theories to identify commonalities and differences. Gaps in the theory base, existing literature and current study’s data were noted to highlight useful and original areas for further exploration.

Phase 2

Following phase one analysis of the secondary data, the identified gaps, early theory building and feedback from peers and supervisors fed into the questions in the semi-structured interview schedule. The interview questions and analysis continued as a blended process as each transcript was coded and analysed following each interview. The same project in NVivo was used for the coding of phase two data, with new codes and themes being added to the existing codes. The coding built upon the foundation of the existing framework constructed with the phase one data (Appendix J).

Theory Building

As is typical of GT, theory-building was an iterative process. Throughout the analysis, ways of understanding the relationships focused codes, and subsequent themes were used to form the basis of a GT model. Participants' own words played a strong part in the theory building to maintain credibility (Charmaz, 2014). Memos illustrated the emergence of the model, which shifted and changed as the analysis progressed. This process continued until the GT model, the relationship between the categories and the data linked together.

Quality Appraisal

Throughout the analysis and building of theory, the evaluative criteria outlined by Charmaz (2014) were held in mind. Peers and supervisors commented at various points of theory development and analysis, and their comments, for example relating to the credibility of early themes, were discussed and incorporated. A field supervisor was also consulted and commented on the originality of the analysis. Certain ideas, such as the

'small self', were tested for resonance with friends who experienced mental health difficulties and two participants.

Analysis

Themes and subthemes are outlined in Table 2.

Table 2.

Major Themes and Subthemes.

Major Themes	**Subthemes**
Self-management of mental health symptoms	Gauge of mental health and self-assessment of needs
Why blue space is experienced as special and how it acts as a place to meet variable needs	Special place Room of requirement: *Opportunities to be social and socially distant* *Opportunities for physical activity and relaxation* *Risk* *Consistent and available* *Reminiscence*
Mechanisms/pathways connecting blue space and mental health outcomes	The feeling of awe and activation of the small self Attentional: Mindfulness and gratitude

	Social: meaningful relationships with others and connection to place
Mental health outcomes linked to blue space exposure	Immediate improvement in mental health symptoms Salutogenic effects of blue space exposure (maintaining wellness) No influence/worsening of mental health symptoms

Grounded Theory Model

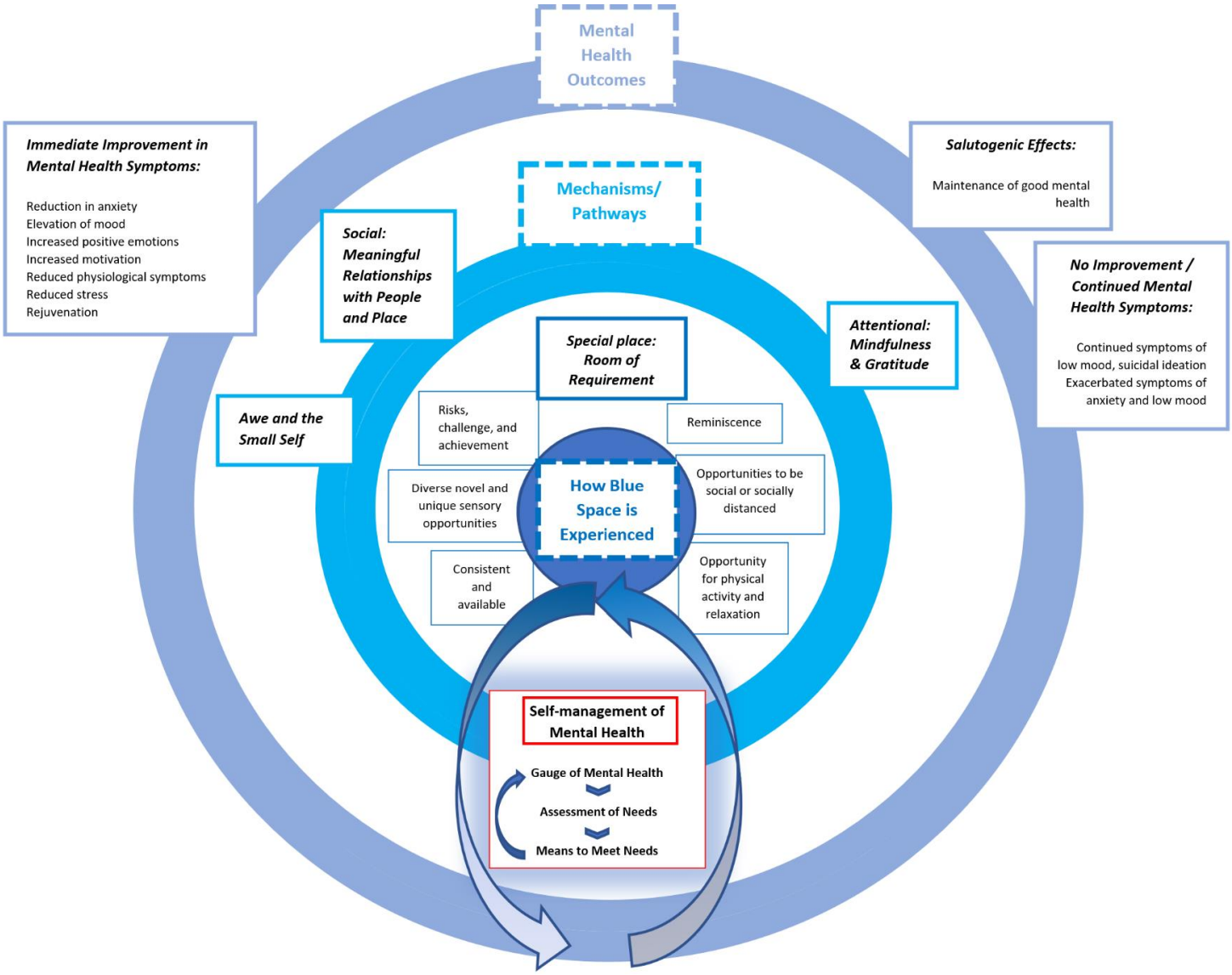

Figure 2. Grounded theory model of how blue space exposure supports the self-management of mental health symptoms.

The themes contributed towards a GT model illustrating the diverse experiences of blue spaces and the ways in which these spaces interact with people's mental health (see Figure 2). This section will discuss the key concepts of this model in relation to the theory, themes and subthemes identified in the data. Extracts from interviews are used throughout this section (shown in italics with the participant number in brackets).

Self-management of Mental Health Symptoms

The concept of intentional exposure has been used in previous blue space research and relates to people intentionally visiting blue environments (White et al., 2020). The analysis highlighted that no participants were in receipt of a 'nature prescription' (were not told by a clinician to visit blue spaces) and were visiting blue space autonomously. Through analysis, it appeared that intentional exposure to blue space was autonomously sought as it supported participants to self-manage their mental health symptoms. A feedback loop whereby participants continuously gauged their mental health, assessed their needs, and targeted specific experiences to achieve the desired mental health outcomes was identified (see Figure 2).

A gauge of Mental Health and Self-assessment of Needs

Participants gave narratives describing how their experience of and outcomes from blue space exposure provided an insight into or *'gauge of'* their mental health. For example, one participant commented on noticing their mental health had deteriorated when they did not feel the connection to the place that they had felt when they were feeling more well *(p.9).* Another participant commented that their ability to tolerate being underwater without panicking is a gauge of their mental health, an indication of it being good *(p.10).*

It's almost like a gauge of where I am mentally and how I'm feeling. If I can be in the sea and be calm, I'm making progress and steps forward, so it's sort of, I don't know, it's a barometer, I suppose. It's my internal barometer. It helps me figure out where I am (p.7)

One participant described how their usual experience of being in blue spaces acted as a benchmark which allowed them to recognize when they were very unwell and when their mental health had improved.

I've got good friends, and we would go through because they knew. I love the sea. I can remember really vividly. I knew that I was really ill when I was completely numb to it…and that's not like me. I'd love being in a place like that. And I really, at that time, just didn't care, I got no I got no relief from it… when I went back to the sea (following discharge from an inpatient environment), it came back (p.9)

The ability to gauge one's mental health allowed for individual self-assessment of needs and enabled participants to target experiences to achieve a particular mental health outcome.

After doing an activity in the sea or with friends. I feel like renewed definitely like I just feel really happy… if I am more anxious, I sit on the rocks, I don't, I've never really come away from the rocks after just sitting on the rocks feeling like really happy. I just feel like I don't know calm. (p.12)

The conceptualisation of blue space as a room of requirement, discussed below, is key to enabling people to self-manage their mental health as blue space not only helps people understand what their needs are but also provides ways to get them met.

Why Blue Space is Experienced as Special and How it Acts as a Place That Meets Variable Needs.

Special Place

Many participants described experiencing blue space as being 'special'. Participants articulated a difficulty in knowing exactly why such spaces are special

describing opportunity for activity, unique sensory experiences, social opportunities, and reminiscence as being key aspects of blue space experiences. Most people reported going through multiple experiences in parallel. There was a sense of universality across participants' descriptions of blue spaces being their favourite environment. Specifically, many participants described blue coastal environments as being preferable to city space, green space and other blue spaces. Many of the participants had lived, at least temporarily, in areas away from the coast and found themselves moving (e.g., following retirement *p.8*) or returning (e.g., after university *p.13*).

Participants described the different feelings evoked in blue spaces.

for me, it's the sea the coast, then that kind of gets my heart racing more than the green places (p10)

I don't feel you get the freedom in green spaces that you do by the sea (p.9)

Participants specifically commented on how different their sensory experiences of coastal blue spaces were compared to other environments.

I think down the beach I'm concentrating on the sounds of the waves and calm myself down. And at the park, not being rude, but there is quite a few kids so you have screaming kids and stuff (p.11)

An important aspect of the specialness of these environments appeared to not only be the availability of social opportunities but also the sense of people in coastal spaces and communities being different.

I've seen the difference in how people are in other parts of the country... more than anywhere I've ever lived in my life before, it's nice to have that strong sense of community (p.2)

the people here are a lot more friendly a lot more accepting and a lot more laid back. (p.9)

You see very little aggression and very little conflict, bloody London they don't speak to you (p.8)

There were efforts made by participants to recreate the experience of being in blue spaces, but a sense that the experience could not be replicated, and needs could not be met adequately in alternative spaces.

What you get from being in the water by the sea, being in the water by green space sounds like a good replacement because you would think that you'd get the same feeling being in a swimming pool because it's beautiful looking out onto the forest…It should be the same feeling but no it's just not, you cannot recreate the feeling elsewhere (p.9)

Room of Requirement

The successful self-management of mental health symptoms requires one to be able to meet perceived needs. Participants reported a diverse range of mental health difficulties, and a common experience of blue spaces meeting their different needs emerged from the data. Participants required different experiences when they were feeling well to when they were struggling. Blue spaces were reminiscent of, to use an idea from Harry Potter written by JK Rowling, “rooms of requirement” in that they often met participants changing needs. Room of requirement refers to how blue spaces provide a unique diversity of experiences to fit the requirement of individuals. The room of requirement acts as a descriptive umbrella term for the range of experiences reported by participants. Experiences that emerged are presented here.

Opportunities to be Social and Socially Distant

Social interaction is a contributing factor to many mental health conditions (Moorey, 2010; Nezlek et al., 1994). In the self-management of symptoms, participants described how blue spaces provided opportunities where apparently contradictory needs for both social interaction and social distance can be met.

It's more of a social activity when you go in the sea versus when you go and sit on the rocks, it's more of a solitary kind of experience (p.12)

There's an element of community but also an element of the solitary experience I think, good for connecting to myself and other people (p.5)

Opportunities for Physical Activity and Relaxation

Similarly, to the diverse social experiences available to meet individual needs, participants' accounts of blue space's providing opportunities to engage in varied physical activity and physically undemanding activities were important.

Just paddling jumping over waves, like playing and having fun… sitting in the beach hut, drinking hot chocolate it just (exhaled deeply) (p.9)

Swimming, surfing, walking was referenced by the most participants regarding experiences of physical activity. Reading, sitting, and *watching the world go by* (p.10) are examples of less physically demanding experiences.

Risk, Challenge and Achievement

Participants spoke of risks posed by blue spaces, such as the risk of drowning (i.e., unpredictable tides and cold water/hypothermia).

The power of the sea and how changeable it can be, we were very wary of quicksand and the tides changing very quickly and getting cut off…I've seen it a few times since and I've seen other people get caught out and it is a scary thing. (p.4)

Participants also spoke of how the presence of risk can enhance the experience of blue spaces, linking to feelings of excitement. This could be that risk presents a challenge and activates subsequent feelings of achievement.

You're constantly looking at the horizon for waves coming in…but that's what drew me here it really puts you in your place…Yes it's exhilarating when you get back on your board (p.6)

Risk and discomfort associated with the coldness of the water was also framed as a positive experience.

you find a bit more solace in cold water… it makes you feel alive (P.6)

The importance of risk in elevating some experiences of blue space was emphasised by a sense that using equipment to mitigate this risk (i.e. wetsuits) took away from the experience. Essentially, there was a perception that meeting one's needs was considered worth the risk.

A wetsuit feels totally alien, it restricts your movement, and I don't feel as if I'm in the sea, I'm kind of suspended in some other vessel really…I'm like in the minority because I'm just in my swimsuit and everyone's in wetsuits and I'm thinking everyone is missing out on a key part of that connection with the sea (p.1)

Consistent and Available

Participants highlighted that the availability and consistency of blue space were important as it was a reliable resource. With regards to the self-management of mental

health symptoms, this aspect of a blue space experience contributed towards empowering participants to feel equipped to assess and respond to their mental health needs as and when they needed. The door to the room of requirement is always open.

It's always a bit of an escape like an open door I suppose it was my best card against my mental health and it is always there… I can have consistent therapy. (p.6)

Reminiscence

Reminiscence is a naturally occurring human process and has been found to meet needs associated with identity formation, learning from past events with regards to problem-solving behaviours and activating positive feelings and feelings of connection (Westerhof et al., 2010). Participants described memories and important life experiences associated with blue space.

It brings back memories of being with friends of ours who we've taken down there (p.10)

I've got loads of really lovely childhood memories by the beach… I got married overlooking the beach, just all my most memorable experiences in life were there. I can, I can remember them so vividly… happy happy memories (p.9)

Experiences of reminiscence in blue spaces were not always related to happy memories and were sometimes linked to difficult memories such as remembering times where participants had contemplated suicide. Although this memory is not a 'happy' memory, it held significance and may be seen as supporting future problem-solving behaviours.

I can go up and I can sit on the cliff where I was going to jump and I can watch the sea now, I have people tell me it's quite a macabre thing but for me, that is a very

significant point because that was a massive turning point in how I dealt with my mental health problems (p.2)

Mechanisms/Pathways Connecting Blue Space and Mental Health Outcomes

The experience of blue space feeds directly into the mechanisms or pathways connecting experiences of blue space to mental health outcomes (see Figure 2).

Feelings of Awe and Activation of the Small Self

Although the word awe was not specifically used by participants in describing blue coastal spaces, they frequently mentioned aspects of the environment that were linked to a sense of awe. Participants referred to a perceptual vastness, the unobstructed views of the sea and sky unique to blue coastal spaces and that this, in turn, gave them a different perspective on their own problems, as smaller.

to have such a large vista and to see the horizon and to have that sense of space (p.4)

the sea is a fully open space… it's just huge and so vast (p.6)

Participants described how the visual vastness of blue spaces made them feel small, and by extension, made their problems/worries feel small.

It gives me perspective and I think it's really difficult to worry about little things when you're looking at this massive expanse of water (p.10).

To see a lot of sea and sky makes you feel so small. Some people can't understand that feeling small is a positive thing but it is because it makes you realise that the problems you've got are nothing really… makes me realise my problems aren't that much in the grand scheme of things. (p.2)

Attentional: Mindfulness and Gratitude

Participants made sense of the interaction between blue space and mental health using terminology linked to mindfulness-based interventions. One participant discussed their experience of falling off a surfboard.

When you fall off and you get pushed down it's cold and it's dark and can be a little bit more scary but it teaches you to breath and it teaches you to relax because the worst thing you can do in any situation if you're under the water is to panic. Things that are taught in a lot of mindfulness and a lot of breathing techniques you have to use. You just count in your head 1, 2 , 3…it won't be any more than 4 or 5 seconds but in your head it will be: 'I'm going to come up soon!'. (p.6)

Others indirectly described how blue environments facilitated people to be present and focus attention on the current moment.

Naturally, the overthinking turns down when I am there…just sort of enjoying being in the moment and not really thinking or forcing it, I'm just naturally sort of looking around and wondering (p.13)

If there's a lot going on in my head, ideas whizzing around all the time and when I'm in the sea I'm very much just there present… it's very much about being present (p.1)

Gratitude has been identified as a mechanism that has been increasingly targeted in mindfulness-based mental health interventions (Jans-Beken et al., 2019; Petrocchi & Couyoumdjian, 2015). Participants reflected on feeling grateful and lucky when in blue spaces.

It is definitely a love for the sea. There's a real appreciation and gratitude for being able to be close to it and experience it (p.5)

It's a fantastic feeling of not ownership but we're so lucky to have it so close (p.4)

Social: Meaningful Relationships With Others and Connection to Place

Nature connectedness has been found to mediate mental health outcomes (Cartwright et al., 2018) and has been identified as a potential way of activating social mechanisms linking blue spaces to health outcomes (White et al., 2020). All participants described a deeply emotional connection to blue spaces.

I've always had a connection with it from an early age (p.6)

My whole world. My whole enjoyment… I have such strong feelings towards it (p.9)

Participants described being in relationship with blue space.

Became more of a swimmer which actually brought me into a relationship with it (p.5)

Previous research has queried the extent to which nature connectedness is felt in marginalised populations (Bell et al., 2019). All participants in this study would likely classify as marginalised due to their mental health difficulties, and two participants, who also had physical disabilities, reported a strong connection to and sense of relationship with blue spaces.

You see just the most incredible things on dives… it's like being connected to another world, part of something (p.10)

Feelings of loneliness are frequently discussed in mental health literature (Hawkley & Cacioppo, 2010). The connection participants felt with blue spaces seemed to appease this feeling without necessitating human contact or interaction.

I'm alone but not really, like even when the beach is deserted, I don't feel lonely… In town I can feel much more alone, especially if I am not feeling well… even if it is a busy Saturday or something (p.9)

Mental Health Outcomes Linked to Blue Space Exposure

A key aspect of this research is that all participants autonomously sought out blue space exposure to self-manage their mental health difficulties and achieve change in their mental health symptoms. There was a unanimous and consistent perception of therapeutic benefit, both in the immediate reduction in symptoms or long-term maintenance of good mental health however, there were also accounts where blue space exposure did not result in a change and could exacerbate symptoms.

Immediate Improvement in Mental Health Symptoms

Many participants directly referenced a conscious and reactive utilisation of blue space for its immediate improvement of their mental health symptoms.

And I moved down here because it was all a relatively conscious life choice towards having that as one thing that made me feel, that sort of was, a coping mechanism, I've never found a better therapy (p.6)

Participants reported that blue space experiences led to reduced symptoms of anxiety such as catastrophising (p. 11), panic attacks (p.7 & 10) and symptoms of depression such as low mood (p.9) and reduced motivation (p.8).

Salutogenic Effects of Blue Space Exposure (Maintaining Wellness)

In the context of this research, Salutogenic effects refer to the effects of blue space exposure on facilitating longer-term maintenance of good mental health (as opposed to appeasing symptoms of mental health difficulties). Participants noticed better mental health when experiencing blue spaces more regularly. Participants reflected on generally better mental health when living in coastal communities.

I have no regrets about moving here, I go to the beach every day it doesn't matter about the weather… I don't have any of those issues now (mental health), just so much happier now, I'm content (p.8)

Some participants who were interviewed during the national lockdown associated with the Covid-19 pandemic noted that their mental health had deteriorated during this time. Participants inferred that blue space exposure maintains mental wellness and that having this taken away had a detrimental impact.

I'm not doing the exercise and stuff in lockdown. I put on a good couple of stone because there's no pleasure in going for a walk and not being able to see the sea… I am just sleeping all the time because I can't do what I want to do… Not going to the beach has been the most difficult part of it all (P.9).

No Influence/Worsening of Mental Health Symptoms

Some participants noted that exposure to blue space could sometimes have no impact on mental health symptoms. The interaction between blue space and suicide was unclear (i.e., whether it made the ideation stronger or provided access to means such as high cliffs). Participants who reported this spoke in relation to times where their mental health had been particularly poor (p.9, 2 & 6). Participants highlighted that a lack

of change in their mental health symptoms following blue space exposure was an indication or gauge that their mental health had significantly declined or was *at its worst (p.9).*

Some participants highlighted that, at times, some experiences of blue space exposure exacerbated their mental health symptoms, particularly in relation to anxiety symptoms. One participant spoke about this in relation to panic.

I was born without any arms and swimming on your front when you don't have any arms, it's really difficult because you can't lift your head up to take a breath and it makes me panic (p.10)

A female participant spoke about it in relation to feeling that blue spaces are potentially unsafe at night, articulating a perception that assault is more of a risk which made her anxiety worse.

(At night) the beaches are dark and big so you can't see many people, it makes me quite anxious, I haven't been attacked or anything, but I feel like that could happen yano, scary. I don't know if that's because I am a girl or whatever… I would go with someone else (p. 13)

Discussion

The research aimed to explore how people with mental health difficulties use local coastal environments and understand how this is related to their mental health symptoms. Within this, the researcher wanted to understand the pathways and mechanisms by which blue space interacts with mental health outcomes. This study highlights how people living in coastal counties with lived experience of mental health difficulties actively use blue spaces in gauging their mental health, assessing their

mental health needs, and using experiences available in blue space to get these needs met, which enables them to **self-manage** their mental health symptoms. In this section, clinical implications, strengths, limitations, and areas for future research will be discussed in relation to the existing literature base.

Formal self-management courses are widely used in chronic physical healthcare settings and are starting to be used within mental health (Berry et al., 2019; Davidson, 2005). Formal self-management courses position client as expert and support clients in assessing one's mental health needs and knowing what they can do to get these needs met. This analysis highlighted how blue space exposure might act as a gauge allowing insight into the severity of mental health difficulties. This is informed by the experience of and perceived outcomes during exposure to blue environments and informs self-assessment of mental health needs. Participants then met these needs by seeking out specific blue space experiences with the intention of them mediating the impact of difficult mental health symptoms.

Bell et al. (2019) suggested that our constantly changing internal worlds are mirrored by the flux and changes in natural environments. Conceptualising blue spaces as 'rooms of requirement' illustrated how blue spaces offered a fluctuating and diverse range of experiences and could be used differently in response to peoples personal and fluctuating mental health needs. Analysis suggests that like formal self-management courses, blue spaces enable self-management and empower individuals to feel equipped to take ownership of their mental health needs (Berry et al., 2019).

Previous models have been proposed to explain the relationship between natural environments and health, but they have been broad and non-specific (White et al.,

2020). An important aspect of this paper is that a model was developed that is specific to blue spaces in relation to people with mental health difficulties living in coastal UK communities. It is novel in its specificity and its consideration of more deviant health outcomes (i.e., exacerbation/lack of reduction of mental health symptoms).

Mechanisms and pathways identified in this paper support an increasing body of evidence suggesting that social and attentional mechanisms are important in understanding the relationship between mental health and blue space (White et al., 2020). This study extends these findings suggesting that attentional mechanisms associated with the experience of awe and activation of a small self-perspective, mindfulness and gratitude could further explain the link between blue space and mental health, particularly in relation to the use of blue space in self-management of mental health symptoms.

This study highlights an entanglement of risk, challenge/achievement and enjoyment, and reticence regarding the use of equipment to mitigate risks which have also been identified by blue space research where participants did not identify as having a mental health condition (Foley, 2015). In addition to overcoming the physical discomfort in the experience of feeling cold, this study posits that experiencing emotional pain, such as hopelessness and suicidal contemplation, in blue spaces can result in specific blue spaces acquiring a symbolic meaning of overcoming, which can also act as a gauge of mental health improvement (a sense of ‘look how far I’ve come’).

Findings suggest that theories such as ART and PSRT could be applied in relation to explaining the relationship between blue spaces and mental health. The themes identified suggest that blue spaces do reduce physiological arousal as

participants reported a reduction in panic symptoms and reported feeling calmer when exposed to blue spaces as predicted by PSRT (Berto, 2014). Themes relating to attentional mechanisms and a shift from being internal to externally focused (small self) to being more present (mindful) and the restorative effect this has was demonstrated in a reduction in mental health symptoms. This is aligned with predictions in ART however, the model proposed in this paper goes beyond theory focused on the individual to embed experiences in time, place, and social context (Stevenson et al., 2018).

Limitations and Areas for Future Research

This study has four main limitations. First, findings are context-bound to the participants and settings in which recruitment occurred (Green et al., 2007). While generalizability is not a prerequisite of qualitative research (Sandelowski, 1986), some of the findings of the study can be verified. Thus, the potential exists for the current GT model to contribute to the greater body of knowledge (White et al., 2020). Additional value could be generated by further qualitative study, particularly building upon more deviant themes, to further understand why blue space exposure does not influence/exacerbates mental health symptoms in some people, exploring specific barriers.

Second, both sets of data were collected from participants who had been sufficiently motivated to participate in research related to blue spaces, responding to the researcher's recruitment efforts, and contacting the researcher directly to discuss participation. Thus, self-selection bias may have precluded participants who were not coping well with their mental health difficulties or those who did not perceive blue

spaces to interact with their mental health. Future research should consider the inclusion of these demographics (Helbich et al., 2018; Gascon et al., 2018).

Third, the study considered only the perspectives of adults. With a high rate of mental health difficulties in children and young people in coastal communities, gaining an understanding of how blue environments are used in this demographic could also provide beneficial insight into how blue space can be incorporated into clinical practice to support good mental health outcomes.

Finally, the use of secondary data was a pragmatic solution to an unprecedented disruption to recruitment. However, this change disrupted the traditional grounded theory two stage analysis and meant that incomplete themes could not be further explored, and thus theoretical saturation was not reached.

Clinical Implications

This study suggests potential in utilising coastal spaces to support people with mental health difficulties, and clinical psychologists, particularly those working in coastal communities, should endeavour to become more literate in environmental psychology.

Clinicians carry out routine assessments of risk where disclosures of historic attempts/thoughts related to harming oneself can influence risk management, formulation and treatment plans. It is important to recognise that access to blue spaces where risk has historically presented could be important in the self-management of mental health symptoms, and discouraging access to these environments could be detrimental.

Clinicians could use the model suggested in this paper to facilitate clinical discussion and compliment assessment, formulation and treatment with clients who

already use blue spaces in the self-management of their mental health. Typically, clinical psychologists work in an integrative way, combining models to target specific mechanisms of change. Understanding how clients use blue spaces and understanding what mechanisms might be responsible for the perceived benefit to their mental health could provide insight regarding what formal interventions may be beneficial. For example, clients describing benefits of blue space related to how it shifts their attention to the present moment (mindfulness) may suggest that targeting attentional mechanisms within formal clinical interventions (i.e. third wave CBT approaches; Mindfulness, Acceptance and Commitment Therapy, Compassion Focussed Therapy) could complement and enhance their ability to self-manage mental health symptoms. This could be particularly important for clinicians working in coastal communities as this study identifies that people in such communities **are** actively using blue spaces to self-manage their mental health symptoms. Clinicians could acknowledge this process with clients to illustrate that they are 'experts' of themselves and work clinically to develop existing skills which empower individuals to feel able to take ownership of their mental health needs, particularly in people with mild to moderate mental health needs.

Conclusion

Intentional and autonomous blue space exposure was found to facilitate the self-management of mental health symptoms. Findings indicate that people perceive blue space exposure to have both a reactive and preventative impact on mental health symptoms and that this may be mediated by the severity of mental health symptoms. This study supports the notion that social and attentional mechanisms are important in explicating the relationship between blue space and mental health but highlights

occasions where blue space exposure can worsen or have no effect on mental health symptoms.

There is considerable opportunity for further research through a range of mental health conditions and demographics in further exploring relationships between blue space and mental health in people who do not use blue spaces to self-manage their mental health to understand more about specific barriers to accessing the benefits of blue space exposure.

Overall, this study suggests that an added value of blue space environments for people living with mental health difficulties is that they provide the necessary conditions that empower individuals to feel able to self-manage their mental health symptoms.

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Appendix A: Participant Consent Form

Participant Identification Number:

Title of Project: How are blue, coastal spaces experienced and used by people with lived experience of mental health difficulties?

Name of Researchers: Emily Hale, Celia Morgan, Janet Smithson

Please read the following statements and initial in the boxes at the end of each statement.

Please initial box

1. I confirm that I have read the information sheet for the above project. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without my legal rights being affected. ☐
3. I understand that relevant sections of the data collected during the study and may be looked at by members of the research team where it is relevant to my taking part in this research. ☐
4. I give permission for the researchers to have access to any information I provide. ☐
5. I understand taking part of this study involves answering questions during an interview and ☐

having audio recordings of me speaking, which will be used for the purposes of reports and publications in academic journals and this data will be archived for 5 years, then destroyed.

6. I understand that I will be asked about my mental health and I consent to the researchers breaking confidentiality if I indicate I am currently at risk or harm from myself or others. ☐

7. I agree to take part in the above project. ☐

Name of participant	Date	Signature
Name of researcher taking consent	Date	Signature

I agree to allow my contact details to be kept in a secure database and used by researchers from University of Exeter Department of Psychology to contact me about future research projects.

Signature

When completed: 1 copy for participant; 1 copy for researcher/project file.

Appendix B: Participant Information Sheet

(26/10/2019)

Title of Project: How are blue, coastal spaces experienced and used by people with lived experience of mental health difficulties?

Researcher name: Emily Hale, Prof Celia Morgan, Dr Janet Smithson

Invitation and brief summary:

You are invited to take part in this research project, but before you decide whether or not to participate, it is important for you to understand what participation will involve and why this research is being

conducted. Please take time to consider the information below carefully, discuss it with family or friends if you wish, and ask the researchers questions you may have.

Purpose of the research:

We are interested in exploring the experience of mental health in people living in coastal communities. Research from different sources suggests spending time in nature can have a positive impact on physical and mental health. Blue spaces or being near water, in particular, may have added health benefits, but most studies about this area of focus have only looked at routinely collected data from larger populations and areas. Very little is known about how coastal spaces are experienced by people with mental health difficulties.

Why have I been approached?

You have been asked to participate in this study because you currently live in a coastal area, are aged 18 or over and have lived experience of mental health difficulties.

What would taking part involve?

Your participation will involve an in-depth interview (30-45 minutes in length) about your experiences of living by the sea and how this impacts your mental health and wellbeing. A trainee clinical psychologist will interview you via Zoom and it will be helpful if you could endeavor to make sure that you are in a private, quiet location when you participate in the interview. These interviews will be recorded, transcribed, and then deleted.

What are the possible benefits of taking part?

You will receive a £20 Amazon voucher for taking part in this research. You will also have the knowledge that you have contributed to research that may be used to improve mental wellbeing in your community and will increase our understanding of the benefits and challenges of living by the coast.

What are the possible disadvantages and risks of taking part?

The interview may ask you to reflect on potentially distressing information. You can choose to skip any questions you do not feel comfortable answering, or if you feel uncomfortable at any point doing the interview, you may leave without having to give an explanation. If during the interview, the researcher becomes concerned for your immediate safety, they may be required to break confidentiality to ensure that appropriate support is sent. In such an event, you will be told first by the researcher.

What will happen if I don't want to carry on with the study?

You can stop taking part in this study at any time without having to give a reason. After completion, you can also ask for your data to be destroyed and we will endeavour to do this within five working days. You can ask for your data to be destroyed by contacting the researcher on the email address provided at the end of the information sheet.

How will my information be kept confidential?

The University of Exeter securely stores all personal data that is collected for research on its servers. The University strives to be transparent and forthcoming about how your data is processed, analysed, stored, and secured. You will be asked to sign a consent form which will have your name on it. This form will be kept separately from any data obtained from interviews (e.g., audio recordings). Any information we collect from you during this study is stored with a participant ID number instead of your name to ensure you cannot be identified. There will be a password-protected database linking your name to your ID number which will allow the researchers to identify your data if you request it to be deleted. If you opt to

receive information about the results of the study or to be contacted about future research, this information will be kept along with the consent forms, separate from the other data collected. Data will be stored on secure university servers, and that the database linking IDs to names will be stored separately in a separate location from other data. Only the researchers involved with this project will have access to all data , (this includes personal data).

Any audio recordings collected will be transcribed and then erased. All the data collected will be stored in a password-protected database in the United Kingdom for 5 years following collection, after which they will be destroyed.

If you have any questions or concerns about the University's storage and processing of your personal data that cannot be resolved by the research team, further information may be obtained from the University's Data Protection Officer.

Email: dataprotection@exeter.ac.uk

Web address: www.exeter.ac.uk/dataprotection

What will happen to the results of this study?

The results of this study will be written up and submitted to the University of Exeter as a Clinical Psychology Doctoral Thesis. We intend to disseminate the results of this research study by publishing in academic journals, presenting the findings at conferences and meetings, as well as deposit the anonymised data in a password-protected archive. Quotations from the interviews may be used in written reports, but identifying information will be removed. If you are interested in receiving the results of the study, please provide us with an email address and we will endeavour to contact you once the project is finalised.

Who is organising and funding this study?

This study is funded by The University of Exeter as part of the Clinical Psychology Doctorate programme.

Who has reviewed this study?

This project has been reviewed by the Psychology Research Ethics Committee at the University of Exeter.

Further information and contact details

If you would like to contact the research team for further information and/or to take part, please email:

Emily Hale: eh617@exeter.ac.uk

If you are not happy with any aspect of the project and wish to complain, please email Prof Celia Morgan: Celia.Morgan@exeter.ac.uk.

If you have any concerns about the ethical conduct of the research please contact Dr Nick Moberly, Chair of the Psychology Research Ethics Committee: N.J.Moberly@exeter.ac.uk

Thank you for your interest in this project!

Appendix C: Example Memo Written After Reading a Secondary Data Transcript

21st May 2020

Thinking about the beach is making me realise how much I am missing it in lockdown, recognise my interviews might be in or after lockdown is lifted, I hope it is lifted by then, this will change my data. Will it come up as a theme, I think my mental health is deteriorating from not going out. I miss the beach, I wonder if this is making me feel worse, would I feel better if I went? What does this mean about the beach, what exactly do I miss about it? The transcript spoke about the freedom of being in the sea, freedom is something in short supply right now, why does the beach feel like freedom in this data that was collected before the pandemic? Something else about it, what else about the ocean, the waves, but they describe the waves being difficult to navigate, unpredictable, scary, why does this link to feeling free? The transcript talks about exhilaration, excitement, are these linked to freedom? Why am I thinking about freedom, am I focussing on this because it is something I crave? Would I be focussing on this if I was reading it last year? Making me think about surfing, I hurt myself last time but felt like it didn't matter once I got on the board, is this freedom? It was exciting, I wasn't thinking of anything else. Think about this in relation to anxiety with participants? Thinking about the sea, descriptions of cliffs in the transcript, looking into the horizon, judging the waves… the horizon, there is something different about the horizon in the sea or on the beach, just sea and sky, is this freedom? Look at theory and literature around horizon, freedom, excitement, being in the ocean, not being able to go to somewhere, pandemic impact on mental health etc.

Appendix D: Mood Disorders Centre Protocol for Assessing and Reporting Risk

THOUGHTS

"I see that you've said / you mentioned that……. These are thoughts / feelings that people suffering from depression often have, but it's important to make sure you are receiving the right kind of support. So if it's OK, I would now like to ask you some more questions that will explore these feelings in a little more depth."

PLANS

1 Do you know how you would kill yourself? Yes / No

If **yes –** details

---

2 Have you made any actual plans to end your life? Yes / No

If **yes –** details

ACTIONS

3 Have you made any actual preparations to kill yourself? Yes / No

If **yes –** details

---

4 Have you ever attempted suicide in the past? Yes / No

If **yes –** details

PREVENTION

5 Is there anything stopping you killing or harming yourself at the moment? Yes / No

If **yes –** details

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6 Do you feel that there is any immediate danger that you will harm or kill yourself? Yes / No

Details:

Researcher Risk Protocol

To be used following any indication of risk from questionnaire items, responses to interview questions or any other sources.

Look at answers from the sheet to determine the level of risk, A B or C:

Actions by Researcher	***Tell Participant***
All telephone follow-up interviews	*As part of our standard procedure we usually ask people their current whereabouts because very occasionally we may be concerned about people's safety and need to get some assistance for them straight away.*
All answers 'no' apart from Q5 'yes': ↓ **A** →	*I can see that things have been very difficult for you, but it seems to me these thoughts about death are not ones you would act on – would this be how you see things? (if they say yes) <u>I would advise you to make an appointment to see your GP to talk about these feelings</u>*
'Yes' for any **one** of Qs 1-4; plus 'yes' for Q5 and 'no' for Q6 ↓ **B** →	*Things seem to be very hard for you right now and I think it would help if you were to speak to your GP about these feelings. <u>I would also advise you to make an appointment to see your GP to talk about these feelings. In these circumstances we usually write to people's GP as well to tell them that they have been seen by us and have been having some troubling thoughts. Would you happy for me to let the Student Health Centre know?</u>*
Scoring 'no' to Q5 or 'yes' to Q6 ↓ **C** Actively Suicidal →	*I am very concerned about your safety at this moment, I am not a therapist but I would like you to talk to one right now. I am going to make some telephone calls now to arrange for someone to come and talk to you.*

Participant needs immediate help – **do not leave them alone**. Follow your trial's chain of supervisory clinical contact and enact immediate risk procedure. (For follow-up telephone

interviews researcher to alert Student Health Centre, emergency services or crisis team whilst maintaining contact with participant or immediately get help from supervisor or named psychologist from MDC to contact assistance).

Appendix E: Semi Structured Interview Schedule

Intro:

"We're interested in understanding your experiences of living by the sea and if and how this interacts with your mental health and wellbeing. During the interview, we will be talking about your thoughts, feelings and experiences associated with using coastal spaces including both positive and negative aspects of accessing and using these. I have a few questions ready, but if there is anything else that you think is important, then please feel free to tell me."

1. Please, can you describe your favourite place to go to be by the sea?
    a. *Why is this place your favourite?*
    b. *What can you see at this place?*
    c. *What can you hear at this place?*
    d. *What can you feel at this place?*
2. What motivates you to visit the sea?
    a. *What time of year do you visit most? Why?*
    b. *Are there any other reasons you might choose to visit the sea?*
3. How does your mental health impact on your motivation to visit the sea?
    a. *What emotions influence whether you visit the sea?*
    b. *What physical sensations, which you feel are linked to your mental health, might influence whether you visit the sea?*
4. How do you think your mental health impacts on your experience of being by the sea?
    a. *Are there things you enjoy/notice more during this time? What do you think facilitates this?*
    b. *Are there any of the benefits as mentioned earlier of being by the sea that you feel are more different during this time? What do you think is the reason for this is?*
5. How do you feel when visiting the sea and afterwards?
    a. *What physical sensations do you notice in your body?*
    b. *How do you feel emotionally following a visit to the sea?*

6. Do you think your friends/ people you know experience the sea in the same way you do?
    a. *What might be the same?*
    b. *What might be different?*

Appendix F: Facebook Advert

Hello everyone!

I am a trainee clinical psychologist seeking participants for a study looking at how coastal spaces are experienced and used by people who have lived experience of mental health difficulties. Existing research suggests that spending time in nature can have a positive impact on physical and mental health. Being in coastal spaces may have added health benefits, but very little is known about how coastal spaces are experienced by people with mental health difficulties.

This study is being conducted as part of a Doctorate of Clinical Psychology at the University of Exeter.

Taking part involves participating in a 1:1 interview with me (via Zoom) and will last approximately 30-45 minutes. Together, we will explore how you use coastal spaces and reflect on how this impacts your mental health. You will receive a £20 Amazon voucher for participating in this study.

With your help, this research will help develop a model for understanding the interaction between mental health and coastal spaces. This may inform how mental health services can incorporate the use of coastal spaces in their practices.

To be eligible for participation you must live within a 30-minute drive from a beach, have experienced or be experiencing difficulties with your mental health (you do **not** need to provide evidence of diagnosis or evidence that you have accessed mental health services) and be aged 18 or over.

If you are interested in taking part, please contact me via Messenger or by email at eh617@exeter.ac.uk. I look forward to hearing from you!

Appendix G: Signposting Sheet

UNIVERSITY OF EXETER

Thank you for taking part in this study.

We hope the responses we have collected from our interview with you will help us to understand the complex interplay between nature and mental health and shed light on how living by the coast interacts with mental health. If you are concerned about yours or a loved one's mental health and would like to seek further help, please see the below websites for support.

For more details about the research underpinning the Reflect Arts + Minds Project please see our website www.reflectaamp.org

For information, help, and support for people who are depressed please visit **Mind** at https://www.mind.org.uk/

If you would like more information on general mental health support, please visit **SANE** at http://www.sane.org.uk/

For information on what you can do to help cope with mental health and useful information on mental health treatment from a UK perspective visit **Royal College of Psychiatrists** at https://www.rcpsych.ac.uk/

If you would like a summary of useful self-help approaches for depression, please see the PDF on the **Royal College of Psychiatrists** -Help is at hand worksheet *(google search or ask for a copy from the researcher)*

To find the nearest cognitive behavioural therapists to where you live visit **British Association of Behavioural and Cognitive Psychotherapy (BABCP)** at https://www.babcp.com/Default.aspx

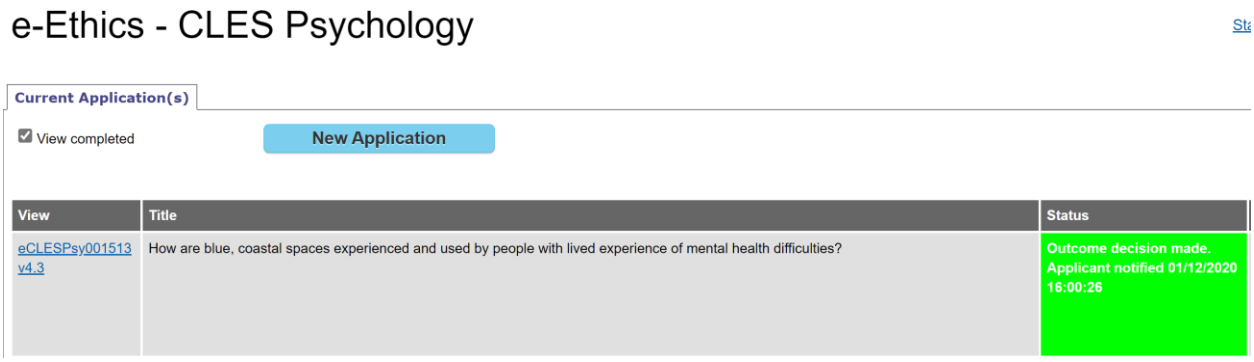
Healthline provides a very comprehensive overview of bipolar disorder as a critical starting point for individuals and/or their loved ones. For more information visit https://www.healthline.com/

The **Samaritans** provide a telephone support line for anyone struggling with their mental health. For help please visit https://www.samaritans.org/

Rethink is a national mental health charity: information, services & a strong voice for everyone affected by mental illness - challenging attitudes and changing lives. For more about them visit https://www.rethink.org/

Thank you again for your time and help on this project. If you have any concerns about the ethical conduct of the research please contact Dr Nick Moberly, Chair of the Psychology Research Ethics Committee on (0) 1392 724656 or N.J.Moberly@exeter.ac.uk

Appendix H: Ethics Approval



e-Ethics - CLES Psychology

Current Application(s)

View completed | New Application

View	Title	Status
eCLESPsy001513 v4.3	How are blue, coastal spaces experienced and used by people with lived experience of mental health difficulties?	Outcome decision made. Applicant notified 01/12/2020 16:00:26

Appendix I: Questions Used to Guide Coding

Charmaz (2014, p. 140)

1. What do you find when you compare your initial codes with the data?
2. In which ways might your initial codes reveal patterns?
3. Which of these codes best account for the data?
4. Have you raised these codes to focused codes?
5. What do your comparisons between codes indicate?
6. Do your focussed codes reveal gaps in the data?

Appendix J: Example of Coding on Nvivo