

The link between social relationships and health and wellbeing: a literature review

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1.0 Background

This literature review sought to collate the existing academic and medical research on the link between social relationships/connections/groups and health over the last 10 years. This review aimed to address two questions:

1. Exploring **what** the medical research tells us about social relationships and the link with health outcomes
2. Exploring **why** social connections could impact on our health outcomes

2.0 The structure and function of our social relationships

When thinking about how our social and community relationships are linked to health, we first need to think about **what aspects of social relationships might be linked to our health**.

The research literature often talks about aspects of social relationships that could be good for our health and aspects that may be bad for our health; but what makes relationships either good or bad for our health? Could it be that the more people we know the better our health becomes? Could it be less about how many people we know, but rather the quality of the relationships we have with others? Could it be the extent to which we feel valued, loved and supported by others? Could it be about how lonely we feel?

The Harvard-based American psychologist Professor Juliette Holt-Lunstad suggests that when looking at the relationship between social and community relationships and health we need to think about social connections in terms of their structure, function, and quality (Holt-Lunstad et al., 2017).

The **structure** of our social relationships tells us about the kinds of relationships that we have with others, how we are connected to others and how many people we have relationships with. We measure structural aspects of social relationships by looking at the number of relationships a person has, the structure of their social network and how socially integrated they are with others. Poor social relationships are indicated by social isolation and small social networks. Good social relationships are indicated by large and diverse social networks and taking part in many social and community-based activities.

The **function** of our social and community relationships considers the functions that we feel are provided to us through our social relationships. This is measured by things such as social support and loneliness. Poor social relationships are indicated by a lack of social support and high levels of loneliness. Good social relationships are indicated by having lots of social support and not feeling lonely.

The **quality** of our social relationships tells us about how good our relationships are with others. This is measured through things such as marital quality and relationship strain. Poor social relationships are indicated by having many issues in the social relationships we have. Good social relationships are indicated by having good quality relationships with others.

We focus in this report on functional and structural measures of social and community relationships, since these are the indicators of relationships that would be most impacted by volunteering – notably loneliness, social isolation, social support and social capital (see glossary for definitions).

3.0 Exploring what the medical research tells us about social relationships and the link with health outcomes

In 2018, the UK government appointed the world's first minister for loneliness and launched their first loneliness strategy. Speaking about this strategy, the then Minister for Care, Caroline Dineage, emphasised the impact that loneliness has on our health and how we needed to address this issue in order to improve health: *"Loneliness can be detrimental to our health and it's unacceptable that so many people still suffer in silence from this social injustice... together we can help build connections, address isolation and support both mental and physical health."*

While the UK loneliness strategy has been important for drawing our attention to loneliness, it is also important that we think about other indicators of social relationships, since there is evidence that health is influenced not just by loneliness, but a range of different indicators of the structure and function of our social relationships.

For the sake of this report, we focus on five of the main health outcomes that have been studied in terms of social relationships:

- cardiovascular disease;
- dementia;
- common mental health disorders;
- suicide; and
- mortality

We have included a considerable amount of research from 'systematic reviews' – this kind of review allows researchers to identify every study that has examined a similar question to see what the whole of the existing evidence base suggests is the answer to their question. These kinds of reviews are seen as being one of the best kinds of evidence we can use for public health decision-making.

We also primarily – but not exclusively – focus on longitudinal studies that have examined the 'risk' of developing different health issues rather than studies that only look at a question at one point in time (cross-sectional). This is because long-term studies that examine risk allow us to infer more about whether differences in social relationships lead to differences in health. When a study is conducted at a given point in time, we cannot really say what leads to what; when we use this type of evidence, it will lead us to identify the issue.

Cardiovascular disease

- ***Poorer functional social relationships are linked to an increased risk of developing cardiovascular disease.***

In 2016, UK researchers Dr Nicole Valtorta and Professor Barbara Hanratty led a systematic review that examined the risk of developing coronary heart disease or stroke for people with poorer social relationships (defined as loneliness and/or social isolation). They found that when combining the results of all the studies that those people with poorer social relationships had a 29% increased risk of developing coronary heart disease and 32% increased risk of having a stroke than people who did not have poor social relationships (Valtorta et al., 2018).

But is the relationship that clear cut?

More recently published individual research studies suggest that we still may not have the full picture on whether both loneliness and social isolation are linked to cardiovascular disease. Dr Nicole Valtorta (2018) and Dr Feifei Bu (2020) both looked at data from the same large-scale English study of older adults and found

that those who were lonely were more likely to experience a cardiovascular event over time, even after accounting for other factors that could explain this relationship. Interestingly, they did not find that social isolation was linked to the development of cardiovascular disease. This finding – that social isolation may not predict cardiovascular events – has been backed up by research using two large UK population studies (Smith et al., 2021), and a German population study (Gronewold et al., 2020). Furthermore, Dr Christian Hakulinen from the University of Helsinki looked at data from one of the largest studies of long-term health we have in the UK (UK Biobank, which is studying nearly half a million people aged 45 and older). In this study, they found that, after accounting for other health-related factors, neither loneliness nor social isolation predicted cardiovascular diseases.

There is a significant amount of good quality evidence to suggest that loneliness and social isolation may be linked to a greater risk of developing cardiovascular disease, but more recently published work seems to suggest that it **could be loneliness more than social isolation which is linked to cardiovascular disease**. So, this could suggest that the function (feelings of loneliness) rather than structure (social isolation) of social relationships is linked to cardiovascular disease.

In 2010, Dr [Jürgen Barth](#) from the University of Bern led a review that identified all studies that had looked at two forms of social support with the risk of developing cardiovascular disease. They examined functional social support (the functions provided by people such as emotional support and financial support) and structural support (the structure of the social support network). They found that low functional support was linked to a 53% increased risk of developing coronary heart disease when compared to people with high functional support. They did not find that structural support was linked to coronary heart disease risk.

In 2014, researcher Minkyong Choi led a review to examine whether social capital might be linked to a range of health outcomes. They found no evidence that social capital was linked to the risk of cardiovascular disease (Choi et al., 2014). This lack of a link was also indicated by a literature review published between 2007-2018, led by Dr Justin Rodgers, which also found little long-term evidence that social capital might be linked to a greater risk of developing new cardiovascular diseases (Rodgers et al., 2019).

Dementia, and cognitive decline

- ***Better structural and functional social relationships are linked to higher levels of cognitive functioning and a lower likelihood of developing dementia.***
- ***Poorer functional and structural social relationships are linked to poorer cognition over time and a higher likelihood of developing dementia.***

In 2019, Dr Elvira Lara, a researcher based at the Autonomous University of Madrid, undertook a systematic review of eight studies to try and understand whether **loneliness** could increase the risk of developing dementia. They found that loneliness was linked to a 26% increased risk of being diagnosed with dementia over time.

In 2018, Dr Ross Penninkilampi from the University of New South Wales in Australia led a systematic review in which they looked at a range of indicators of social relationships and how these could be linked to the risk of developing dementia. They found that having a **poor social network** was linked to a 59% increased risk of developing dementia compared to people who had a good social network, and that **poor social support** was linked to a 28% increased risk of developing dementia when compared to people who had good social support. They also found that in studies that had looked at dementia risk over 10 years or more, those people with good social engagement were less likely to develop dementia when compared to people with poor social engagement.

In 2019, doctoral researcher Isobel Evans, based at the University of Exeter, led a systematic review to examine whether **social engagement** and **social isolation** could be linked to later cognitive functioning in long-term studies. They found that those who were highly engaged in social activities and had large social networks had better cognitive functioning over time, whereas those who were more socially isolated had poorer cognitive functioning over time. A systematic review by Dr Jisca Kuiper, published in 2016, examined

both structural and functional aspects of social relationships, and how these were linked to cognitive decline over time. They found that poor structural social relationships were associated with an 8% increase in the odds of experiencing cognitive decline compared to good structural relationships, while poor functional social relationships (relative to good functional social relationships) were associated with a 15% increase in the odds of experiencing cognitive decline. Furthermore, combined functional and structural poor social relationships were linked to a 12% increase in the odds of experiencing cognitive decline.

Common mental health disorders

- ***There is a significant amount of evidence that poorer functional and structural social relationships are linked to an increased risk of developing depression.***
- ***Good functional social relationships are linked to a lower risk of depression, and the source of support we most benefit from changes as we get older.***
- ***There is some evidence that poorer functional relationships could be linked to a greater risk of anxiety, and good functional relationships to a lower risk of anxiety.***

'Common mental health disorder' is a term that we use to describe two of the most common mental disorders: depression and anxiety. These mental health disorders can be differentiated from general feelings of sadness or worry by their severity, duration and impact on day-to-day lives.

In 2020, the clinical psychologist Dr Maria Loades from the University of Bath undertook a rapid systematic review on the link between loneliness and social isolation with mental health in young people and adolescents. She found evidence from most long-term studies that loneliness predicted later depression (Loades et al., 2020). This link has also been found in a recent review of older adults. In 2021, the researcher Barbara Van As conducted a systematic review that looked at the long-term relationships between loneliness and depression and found that most studies suggested that loneliness was linked to a greater risk of developing depression. Interestingly, she also found that in people who were already depressed, loneliness was linked to a poorer course of depression (such that people were more likely to have their depression re-occur and be less likely to recover from depression over time) (Van As et al., 2021). These findings in specific populations have also been backed up from a currently unpublished systematic review across people of different ages that has been conducted by the UCL-based psychiatrist Dr Farhana Mann, which suggests that adults who are often lonely were 2.3 times more likely to develop a new-onset depression than people who were not often lonely (Mann et al., unpublished pre-print).

There has also been some work indicating that loneliness could be linked to anxiety. In a systematic review focused on younger people, psychologist Professor Michael Maes showed that loneliness was linked to a greater likelihood of developing social anxiety disorder (and vice versa) (Maes et al., 2019). The rapid review of Dr Maria Loades also indicated that loneliness and social isolation were linked to a greater risk of developing anxiety (Loades et al., 2020). Furthermore, in her unpublished review, Dr Farhana Mann included an overview of three studies that loneliness was linked to a subsequent risk of anxiety (Mann et al., unpublished pre-print).

Alongside loneliness and social isolation, other functional and structural indicators of social relationships have also been linked to depression and anxiety. A systematic review of 100 individual studies led by the Canadian epidemiologist Dr Genvieve Garipey looked at social support and depression across the lifecourse. She found that higher levels of social support were associated with a lower risk of developing depression. She also examined sources of social support and found that parental social support was most important for children and younger people. For adults and older adults, she found that spouses were the most important sources of support, followed by family then friends (Garipey et al., 2016). There was also some preliminary evidence from a systematic review by Dr Jiangyi Mann that social support could be linked to a lower risk of anxiety and better anxiety-related outcomes (Mann et al., 2018).

There is also some evidence that the relationships that we have with our broader neighbourhood and communities can be linked to our mental health. For instance, a lack of social cohesion has been linked to a greater long-term risk of developing depression amongst older adults (Baranyi et al., 2020) and lower social capital is linked to more mental health issues in young people (McPherson et al., 2014). However, existing

research from randomised control trials has not yet provided compelling evidence that building up social capital prevents the development of mental health conditions (Flores et al., 2018).

Suicide

- ***Poorer functional social relationships are linked to a greater risk of suicidal thoughts and behaviours.***

A great deal of research into the field of social relationships and health is influenced by research from the 1800's when French sociologist Emile Durkheim observed that those who were less socially integrated (more socially isolated) were more likely to have died by suicide. So, in many ways our interest in social relationships and health stems from this observation that poor social relationships could be linked to suicide.

This observation about social relationships and suicide has been brought up-to-date by a recent systematic review led by the graduate researcher Heather McClelland who is based at the University of Glasgow. In 2020, she published a systematic review that showed that loneliness predicted later suicidal thoughts and suicidal behaviours. She found some evidence that this relationship between loneliness and suicidal thoughts and behaviours could be explained by co-occurring depression (McClelland et al., 2020). Furthermore, in her rapid review on the impact of loneliness and social isolation on mental health outcomes in children and young people, Dr Maria Loades found one long-term study that suggested loneliness could predict later suicidal thoughts in younger people (Loades et al., 2020).

A 2019 narrative review from Rafella Calati from the University of Montpellier also suggested that not only loneliness but also social isolation was strongly linked to suicidal outcomes, in particular suicidal injury and suicide attempts (Calati et al., 2019). There is also some evidence from other systematic reviews that low belongingness (Hatcher and Stubbersfield., 2013) is linked to suicidal thoughts and behaviours.

In 2020, Dr Xiaofei Hou from the Central South University in China led a systematic review that sought to determine whether social support interventions were effective in preventing suicide. They found that those people who took part in the different social support interventions they examined had significantly fewer suicide attempts than those who did not take part in the interventions (Hou et al., in press).

Mortality

- ***Poorer functional and structural social relationships are linked to a greater risk of mortality.***
- ***Good functional and structural social relationships are linked to a lower risk of mortality.***

The interest in the link between social relationships with mortality in large part stems from a 2010 systematic review by Professor Juliette Holt-Lunstad, which found that both loneliness and social isolation were linked to a greater risk of dying sooner. In 2015, Professor Holt-Lunstad led an update of this systematic review to include more research. Her team found that those who were lonely had a 26% increased likelihood of dying than those who weren't lonely, and those who were socially isolated had a 29% increased risk of dying than those who weren't socially isolated. These results remained largely consistent when the researchers accounted for different factors that could influence the results, such as age and gender. However, the researchers did acknowledge that underlying health could in part explain these relationships. The often-quoted phrase that "loneliness is as bad for our health as smoking 15 cigarettes a day" actually stems from this research. This is because this 26% increased likelihood of dying for lonely people is equivalent to that seen in people who smoke 15 cigarettes a day.

Interestingly, the estimate for the link between loneliness and mortality remained largely consistent when Dr Laura Rico-Urbe undertook a similar review three years later with additional papers. Her review found that loneliness was associated with a 22% increased risk of mortality (Rico-Urbe et al., 2018). There has also been some recent work to suggest that those who are both lonely and socially isolated could have a higher risk of mortality when compared to groups who are neither lonely nor isolated (Beller and Wagner., 2018; Ward et al., 2021).

There are also a series of reviews that suggest that good social relationships could also be linked to a lower risk of mortality.

In 2013, Professor Eran Shor from McGill University in Canada undertook a systematic review to look at whether social support was linked to mortality. He found that those people with lower levels of social support had a 30% higher risk of mortality compared to those with high levels of social support. He went on to examine which kind of social support was most beneficial, and he found that social support from family members was more beneficial than social support from friends. He also found that the link between social support and mortality changed according to age, with the impact of social support on mortality being more pronounced at older ages (Shor et al., 2013).

In 2019, Dr Annahita Ehsan undertook a systematic review of systematic reviews to bring together research that examined the relationship between social capital and health outcomes. She found that there was some evidence from prior systematic reviews that social capital could be linked to a decreased risk of mortality (Ehsan et al., 2019). One of the reviews they included, from Professor Frederica Nyqvist, examined different kinds of social capital and found that greater social participation and larger social networks predicted a lower risk of mortality; it also found some emerging evidence that trust in others could also be linked to a lower risk of mortality (Nyqvist et al., 2014).

4.0 Exploring why social connections could impact on our health outcomes

a. Biological explanations

- ***Having poorer structural social relationships is linked to higher levels of bodily inflammation and having good functional relationships is linked to lower levels of bodily inflammation.***
- ***Having poorer functional social relationships is linked to higher blood pressure.***

Biological explanations for why social relationships influence health have looked at a range of different biological risk factors for the development of chronic illness, mental illness and death. There are a range of biological factors that people think could link social relationships with health outcomes and we explore two of the biological responses that have the most research evidence behind them below (bodily inflammation and cardiometabolic risk factors). However, it is worth noting that a great deal of the existing evidence is cross-sectional, meaning that we don't know whether poor relationships influence biology or if biology influences our ability to engage in our social relationships.

Bodily inflammation – Bodily inflammation is when our immune system produces different chemicals to help fight off infection or injury. Short-term bodily inflammation is useful for us because it helps us to fight off infection and injury; however, long-term (chronic) inflammation can be problematic as it increases our risk of developing things such as cardiovascular disease, dementia and even some mental illnesses, such as depression. Chronic inflammation happens when our immune system can't turn itself off when it is no longer needed, and some researchers think that social relationships could directly influence our immune system.

A systematic review led by Dr Kimberley Smith at the University of Surrey, published in 2020, showed that social isolation was linked to higher levels of chronic inflammation but did not find any robust existing evidence that loneliness was linked to chronic inflammation (Smith et al., 2020). Another review from Professor Bert Uchino, published in 2018, found that people who were more socially integrated and/or had more social support had lower levels of chronic inflammation (Uchino et al., 2018). These reviews both suggest that functional and structural aspects of social relationships could be linked to bodily inflammation.

There are two main reasons that people think social relationships could influence bodily inflammation: evolutionary theories and stress-oriented theories. The evolutionary reason for social relationships increasing bodily inflammation comes from the pioneering work of the UCLA-based social psychologist Professor Naomi Eisenberger, who suggested that we evolved to 'turn on' our inflammatory response when we were socially isolated so that we would be prepared for a possible infection or injury in the absence of having people around who could help us deal with this situation (Eisenberger et al., 2017). The stress-oriented theory proposes that because humans are a socially oriented species, having poorer social relationships could represent a source

of stress, and we know that higher stress levels have been consistently linked to chronic inflammation (Marsland et al., 2017). We consider the stress-response to social relationships in more detail below.

Cardiometabolic risk – Cardiometabolic risk is a term that we use to capture a range of biological risk factors that are linked to a higher risk of developing a range of long-term conditions. ‘Cardio’ includes things such as high blood pressure and ‘metabolic’ includes risk factors such as obesity, high blood fats, high cholesterol and high blood sugars. Some of the conditions that higher levels of these risk factors have been shown to lead to include cardiovascular diseases, dementia and mortality. Therefore, researchers have wondered whether cardiometabolic risk factors might be directly influenced by our social relationships and whether this may be one way in which our social relationships influence long-term health outcomes.

Some evidence has come to light that loneliness and social isolation could be linked to higher blood pressure (Paul et al., 2021), but it is worth noting that there is a lack of consistency about whether social relationships are linked directly to different cardiometabolic risk factors (Das., 2019; O’Luanaigh et al., 2012; Uchino et al., 2006). Instead, most researchers think that rather than social relationships having a direct impact on cardiometabolic risk factors, this could instead be an indirect relationship explained via a stress pathway (see below).

b. Stress-related explanations

- ***Having poorer social relationships is potentially stressful and activates the biological stress response, which can be bad for long-term health.***
- ***Having good structural and functional social relationships is linked to lower stress-related biological exhaustion.***
- ***Poorer functional and structural social relationships can increase the biological stress response when faced with a stressor.***

There has been a great deal of research showing that long-term stress is bad for both our physical and mental health, and stress is a risk-factor for many of the health issues that we have examined in this review.

We have evolved as a social species, and so one may not be surprised to learn that having poorer or fewer social relationships has been identified as a source of stress for people (Hawkley and Cacioppo., 2010). In fact, two of the leading experts in the field of loneliness – Professors John and Stephanie Cacioppo – have proposed that the impact of poorer social relationships on health could be in large part due to the biological stress-response (Cacioppo et al., 2015).

One overarching theory that helps us to understand how long-term stress could be linked to poorer health, is something we call the ‘theory of allostatic load’. Originally proposed by Professors Bruce McEwan and Eliot Stellar in 1993, this theory is quite complex but put at its most simple it proposes that when we are stressed for a long time our body exhausts itself, and this biological exhaustion puts us at a greater risk of developing physical and mental illness. As with our inflammatory response, the stress response is highly useful in the short term but can become an issue if it doesn’t switch itself off. The evolutionary explanation for this is that the stress-response exists because when we were faced with a stressor in the past, we either needed to be biologically prepared to fight it or to run away from it as quickly as possible. The stress-response involves the release of chemicals that prepared us for ‘fight or flight’ (by doing things such as increasing our heart rate and releasing blood sugars). The theory of allostatic load proposes that stress is good in the short term, but that we always need to return to normal (a state termed allostasis) again to maintain our health. If we don’t return to normal again, this can lead to exhaustion and an increased risk of poor mental and physical health (McEwan and Stellar., 1993).

A 2019 systematic review from Professor Anders Larrabee Sonderlund at the University of Denmark indicated that social relationships could be linked to allostatic load. They found that higher levels of social connectedness (as indicated by better functional and structural relationships) were linked to lower allostatic load (Larrabee Sonderlund et al., 2019). They proposed that this was likely due to the role of social relationships acting as a ‘buffer’ for stress (see the section on ‘social explanations’ below for more context of what this means). So, it is possible that having more social relationships could be linked to a lower biological

stress response, but we need to be mindful that the studies they examined were mostly cross-sectional (meaning that it could be that more social relationships leads to lower allostatic load, or that those who have lower allostatic load and are less exhausted are more likely to be able to take part in more satisfying and frequent social encounters).

Interestingly, there have also been some systematic reviews that have indicated poorer social relationships could increase the biological response to stress. For example, systematic reviews have found evidence that lonely people who are exposed to a stressor in a laboratory have a higher biological response to stress when compared to non-lonely people (Brown et al., 2018; Paul et al., 2021). There is also some evidence that other indicators of social relationships, such as social isolation, are linked to an increased biological response to stress (Grant et al., 2009).

Stress is also linked to certain other poorer health behaviours (such as poorer quality sleep) which are also linked to long-term health outcomes, which we also explore as possible mechanisms below.

This could mean poorer social relationships are a source of stress that have a big impact on our body and health, but also that poor social relationships can change how our body responds to stress.

c. Social explanations

- ***It is proposed that social relationships could directly benefit our health and/or help to 'buffer' the impact of stressful events.***

In 1985, Professors Sheldon Cohen and Thomas Wills came up with two main explanations as to why social support could be beneficial for our health. The first, called the direct main hypothesis, proposed that social support is directly beneficial for our health because our social networks provide us with regular positive experiences and when we have many positive interactions with others, it helps us to feel good and have high levels of self-worth. They also suggest that these positive social relationships could directly impact us biologically (as explained above). The second hypothesis, called the buffering hypothesis, is that our social relationships 'buffer' us when we experience stressful life events. In short, when something bad or stressful happens, having lots of social support helps buffer the impact of these life events (i.e., our friends and family help us to cope with difficult situations in our lives). There is a great deal of evidence for both these hypotheses: that social relationships directly benefit us, but also that they help us cope with difficult situations in life.

d. Psychological explanations

- ***Good functional and structural social relationships can make us happier, which could help keep us healthier.***
- ***Poor functional and structural social relationships can make us more unhappy, which can be linked to poorer long-term health.***
- ***Some key psychological theories used by clinical psychologists place the social relationships we have with others at the core of psychological distress and mental ill health.***
- ***There is an increasing recognition that psychology plays a key role in helping us understand the 'downward spiral' of loneliness.***

Having good social relationships can have a direct impact on how we feel. There is a great deal of evidence showing that having more social capital, being more socially integrated and having social support make us happier, increase our feelings of self-worth and self-esteem, and improve our wellbeing (Leung et al., 2013; Nyqvist et al., 2013; Rodgers et al., 2019). When we lack these relationships (i.e., feel lonely or socially isolated), this can be linked to poorer wellbeing, increased depression and less life satisfaction (see Shankar et al., 2015, and section on depression above).

There is also a significant amount of evidence that how we feel directly impacts our health and that people who are happier have better long-term health (Dfarhud et al., 2014; Steptoe., 2019); therefore, it could be possible that when we have more and better social relationships this can make us both happier and healthier. We also observe the opposite: that people who have poorer wellbeing and are more depressed have poorer long-term health (e.g., Bechetti et al., 2019; Nemeroff and Goldschmidt-Clermont., 2012; Santabarbara et al.,

2020). It is possible, therefore, that our relationships may have an impact on our mood and well-being, which in turn may influence our health.

Psychological theories can also help us better understand why people with poorer relationships may have a higher risk of mental health conditions. A group of psychological theories that have their roots in so-called 'interpersonal theory' are particularly useful. The American psychologist Professor Thomas Joiner's 'interpersonal theory of suicide' proposed that suicide results from two states: perceived burdensomeness and something he terms 'thwarted belongingness' (which consists of things such as feeling lonely, feeling socially alienated from others, living alone, having fewer friends, a disjointed family, a conflicted family and socially withdrawing). In short, this theory proposes that suicidal thoughts, behaviours and acts can often be linked to feelings of isolation and alienation (Joiner., 2005; Ribeiro and Joiner., 2009).

Another way in which 'interpersonal theories' help us to understand the importance of social relationships for mental health is by considering one of the main psychological therapies that is advocated for the treatment of depression: interpersonal psychotherapy (Klerman., 1994). This therapy addresses issues that people have in their interpersonal relationships to help improve their mental health. This therapy places our relationships at the heart of why we may develop issues such as depression and has proved to be highly effective in treating depression (Cuijpers et al., 2011).

There is a growing interest in the role that psychological processes themselves play in how we view our social relationships – particularly loneliness. In 2020, the UK-based charity The Campaign to End Loneliness, in collaboration with UCL, published a report on the psychology of loneliness. This report suggested that loneliness is a psychological phenomenon that can lead to what they call a 'downward spiral of loneliness' whereby loneliness can interact with negative thoughts and feelings to influence behaviour and increase social withdrawal, which then leads to more negative thoughts and feelings and further withdrawal (Campaign to End Loneliness., 2020). They suggest that this more severe and chronic loneliness could be linked to worsened long-term mental health and possibly physical health, compared to more acute and temporary states of loneliness.

e. Behavioural explanations

- ***Poorer functional and structural relationships can be linked to poorer health behaviours such as poorer sleep and less physical activity.***
- ***Social relationships are also important sources of norms for health behaviours (which can be linked to both positive and negative health behaviours).***

The social relationships that we have with others can directly and indirectly influence our health behaviours. When we talk about 'health behaviours', we are referring to those behaviours that are known to be good for our long-term health. These include being physically active, eating well, not smoking, not drinking too much alcohol and getting enough sleep. These five health behaviours have been consistently linked to long-term health outcomes (including cardiovascular diseases, dementia, mortality and mental illness).

There is evidence from a range of studies that poorer functional and structural relationships are linked to poorer health behaviours. For example, loneliness has been linked to poorer sleep (Griffin et al., 2020) and less physical activity (Pels and Kleinert., 2016), though there is less evidence of a convincing link between loneliness and alcohol consumption or smoking (Akerland and Hornqvist., 1992; Dyal and Valente., 2015). Social isolation, fewer social ties and smaller social networks have also been linked to poorer health behaviours (Shankar et al., 2011). It has also been suggested that people may be more likely to take part in healthy behaviours when they have social support from others and are more socially integrated (Callaghan and Morrissey., 1993; Nieminen et al., 2013). However, there is the caveat that many studies have been cross-sectional in nature, meaning that we cannot be sure that poor social relationships lead to poorer health behaviours, or whether poor health behaviours could lead to a lower likelihood of engaging with others.

However, having many social relationships doesn't necessarily imply better health behaviours. In health research, our social relationships can have both positive and negative impacts on our health behaviours; we consider a few key theories below:

In 1993, Professors David Levy and Paul Nail came up with the term 'social contagion' to describe the observation that particular kinds of behaviours and illnesses tended to cluster in the same social network. This term was used as a way to describe the fact that particular behaviours and illnesses could spread within the same social network – it can be thought of as the same as the spread of COVID-19, but with behaviours and illnesses rather than a virus. This theory was expanded on by the work of American sociologists Professor Nicholas Christakis and Professor James Fowler, who conducted a series of studies to show how health behaviours such as smoking, alcohol consumption, health screening behaviours, sleep and food consumption clustered in social networks (Christakis and Fowler., 2013). In addition to being relevant for health behaviours, they have shown that social contagion is also relevant for suicide, depression and happiness (Christakis and Fowler., 2013). Indeed, in one study they even showed that loneliness itself is subject to social contagion (Cacioppo et al., 2009). It could be that people in the same social networks have similar behaviours and illnesses because we gravitate towards others who are like us, or that we model our behaviours on those of people around us. This theory would explain why functional aspects of social relationships could be linked to health behaviours, but it wouldn't be as useful for explaining why socially isolated people could have poorer health behaviours.

There are also other social-behavioural explanations that could help us understand how our social relationships can influence our health behaviours. For instance, our social relationships provide us with something social psychologists call 'social norms', which were defined by Cialdini and Trost in 1998 as the unspoken rules and standards that are understood by members of the same group (e.g., the 'social norm' of how much we might drink or abstain from alcohol is influenced by those people that we spend our time with or the culture that we are a part of). These social norms explain why people who have many relationships may engage in particular behaviours, but they also provide a context for why people who are more isolated may not engage in particular behaviours (i.e., if there are a lack of norms upon which they could model healthy behaviours). Social norms are also closely linked to the phenomenon of 'peer influence', which leads us to adopt certain healthy behaviours because we feel pressured by our peers (smoking is a classic example).

5.0 Summary

The evidence covered in this review provides a compelling overview of the link between social relationships and health, and the reasons why social relationships could influence our health. To summarise:

Having good and supportive social relationships could benefit our health and wellbeing – There is a wealth of evidence that when we have good and supportive relationships, this can help improve our psychological wellbeing and is linked to a lowered risk of developing a range of health outcomes such as common mental illness, dementia and cognitive functioning.

Poor social relationships are linked to a range of poor health outcomes – There is a great deal of evidence to suggest that poor social relationships may be linked to a wide range of health outcomes including cardiovascular disease, common mental illness, dementia and cognitive decline, mortality and suicide.

There are many ways in which we can define social relationships, and different kinds of social relationships could have different relationships with health – Perhaps one of the most striking aspects of this review are the myriad ways in which people define social relationships. We chose to place a particular focus on certain key functional and structural indicators of social relationships that might be most impacted by volunteering interventions. This means there are many kinds of social relationships that weren't considered for this paper; for example, we know that having poor quality social relationships is also linked to poorer health and wellbeing. However, we could still see within this review that different kinds of relationships seem to have different links to health outcomes. For example, emerging evidence seems to suggest that functional (perhaps more so than structural) relationships could be linked to cardiovascular health. As the evidence base continues to expand it will be useful for us to know which aspects of social relationships might be linked to specific health outcomes so that we can understand which aspects of relationships to focus interventions around.

The reasons that social relationships are linked to health are complex and multifaceted – There are a wide range of proposed ways in which our social relationships might influence health, from the biological

through to the behavioural, psychological and social. There are also some mechanisms that might 'moderate' (a fancy way of saying 'change') how social relationships influence our health, such as stress. In short, there is no single way in which social relationships influence health and this is likely to differ from person to person, depending on with whom they maintain social relationships and the function, structure and quality of these relationships.

Annex A: Glossary

Anxiety – Characterised by feelings of unease, tension, worried thoughts and unpleasant physical sensations. There are several different anxiety disorders that we can identify based on what causes the person to experience anxiety. These include generalised anxiety disorder (non-specific anxiety), phobia (anxiety is caused by a very specific trigger such as heights or spiders) and social anxiety disorder (anxiety caused by social situations).

Cardiovascular disease – A general term that we use to describe a range of long-term conditions that affect the heart and our blood vessels. These conditions include various heart diseases, heart attacks, stroke and blood vessel diseases.

Cognition – This is a term we use within psychology to describe a range of mental processes that are involved in gaining knowledge and comprehension such as knowing, judging, remembering, thinking, intelligence, attention and problem-solving.

Depression – Characterised by persistent sadness and a loss of interest or pleasure in activities that were previously enjoyable or rewarding. Also linked to disturbances in sleep, appetite, concentration, energy levels, mood and sometimes thoughts of suicide.

Dementia – A general term that we use to describe a syndrome (range of symptoms) related to a decline of brain functioning. This decline will typically exhibit as substantial declines in memory, communication, thinking, understanding and being able to carry out day-to-day activities. There are many different kinds of dementia such as Alzheimer's disease (a kind of dementia linked to things we call 'tangles' and 'plaques' in the brain) and vascular dementia (a kind of dementia linked to micro-bleeds and blockages in the brain).

Health inequalities – Health inequalities describe unfair differences in health and health-outcomes seen based on people being part of a particular group or living in a particular community. These can be due to underlying health but can also be due to non-medical factors. We call these non-medical factors that influence health outcomes the 'social determinants of health' and the World Health Organisation estimates that social determinants of health account for 30-55% of health outcomes (WHO., accessed 2021).

Loneliness – Negative emotional state that arises when a person feels that they lack the companionship that they desire.

Mild cognitive impairment – This term relates to kind of memory loss or general decline in cognitive functioning (e.g., communication, thinking) where people are still able to perform most day-to-day activities. Mild cognitive impairment can be thought of as halfway between normal age-related cognitive decline (as most research shows it is normal to have a slight decline in cognition after the age of 50) and dementia.

Social capital – Networks with shared norms, values and understanding that facilitate co-operation within or among groups.

Social cohesion – Strength of relationships and sense of solidarity among members of a community (social capital is seen as a part of social cohesion).

Social isolation – Lack of ties with other people and the broader community, often referred to as an objective indicator of a lack of social and community relationships.

Social network – The structure of the relationships that we have with others in terms of quality and their relationship to us.

Social participation – The extent to which a person participates in social, cultural and arts-based activities. This includes things such as volunteering.

Social support – A process through which help is provided to others, when someone is there to help another. There are different kinds of social support, including:

- Emotional (comfort and caring)
- Informational (giving advice and guidance)
- Tangible (providing material aid or resources)
- Belonging (shared social activities and a sense of belonging)

Social ties – The number of 'ties' (relationships) that a person has with others. This can be thought of as the quantity of social relationships.

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