

## What are the benefits of green (and blue) space?

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### Abstract

This research briefing looks at the benefits of green (and blue space). Attention is given to the benefits that green (and blue) space provide to both physical and mental health, and the factors, such as accessibility, gender, and socio-economic status, that influence the benefits green (and blue) space are able to provide. While the findings in the literature are notoriously mixed, this review concludes by providing some tentative suggestions on considerations for the future development of green (and blue) space.

### Keywords

Nature, Physical Health, Mental Health, Healthy Cities

### Definition

Within this briefing, the term “green space” will refer to the many types of green land; ranging from parks to natural areas. Hence, the green spaces referred to within the briefing will encompass naturally occurring green spaces, such as forests, but also space created within human-made means such as green roofs and tree-lined streets.

### Introduction

Over the past decade, there has been growing recognition of the positive consequences that having access to good, quality green space can have on the physical and mental health of the population. Some research has suggested that the use of green space can have positive effects on, for example, stroke reduction and on stress levels<sup>1</sup>. However, and despite these findings, across the globe currently<sup>2</sup>, there is a demographic change toward urbanization: in a period of fifty years, the proportion of individuals residing in urban areas is estimated to rise from 46.6% to 69.6%<sup>3</sup>. This has had a variety of visible consequences on the health of the environment, including pollution and climate change, as well as consequences on individual health. Such consequences

have flagged the desperate need for multi-sectoral action to promote health in ever-growing urban populations; leading to the rise of the ‘healthy cities’ movement<sup>4</sup>, of which there has been a prominent presence in Edinburgh<sup>5</sup>. Within this movement, many policies and campaigns are now looking to encourage individuals outdoors into green space in order to improve their health<sup>6</sup>. This briefing, therefore, seeks to examine existing literature on green spaces and their impact on health in order to provide a narrative summary which can be used for the future development of green spaces, as well as research into this area.

As has been mentioned, the benefits of green space, as dictated by research, have been thought to include benefits

to an individual's physical health<sup>7</sup> and mental health<sup>8</sup>. Hence, in order to provide a small summary of current themes within literature on this topic, most of which was sourced from literature deemed as 'grey'. The first section of this research briefing aims to give an overview of the benefits that access and use of green space is said to have on the physical and mental health of individuals<sup>9</sup>. Following this, it will seek to provide an overview of what the research considers to influence the use of green space, looking at accessibility; quality and availability; age; gender and socio-economic status. It will lastly conclude and provide tentative recommendations for those looking to develop green space and for future research into the area.

### **Benefits**

#### ***Physical Health***

Within literature, one of the most prominent mechanisms by which green space influences physical health is through its supposed effects on the physical activity levels of individuals<sup>10</sup>. Morris (2003)<sup>11</sup>, for instance, argues that the environment, and access to it, can 'facilitate or constrain physical activity' by offering or denying opportunities for beneficial exercises such as jogging. Many other studies reach a similar verdict by concluding that the availability of green space has positive effects on the physical health of the population by allowing space for exercise<sup>12</sup>. This use of green space for exercise has, for instance, been reported to be independently associated with heightened survival within the older population<sup>13</sup>. In a similar sense, Hu et al's (2008)<sup>14</sup> study noted that there is a relationship between higher risk of stroke mortality and low

levels of exposure to green space, but it is unknown if this was due to its use for exercise.

Although the conclusion that green space positively affects physical health has been reached within many research articles, some have reached opposite conclusions. For instance, Lee and Maheswaran (2011)<sup>15</sup> found that there is weak evidence for the relationship between physical wellbeing and urban green space, and that environmental/demographic factors, which will be discussed in more detail below, affect the links between green space and its supposed physical benefits.

#### ***Mental Health***

In research, it is clear that green space is thought to positively correlate with lower reported levels of stress and higher health-related quality of life<sup>16</sup>. Research suggests that green space allows for this, as exposure to nature environments is considered to be psychologically restorative, giving individuals the ability to reflect on problems. This, according to select literature, causes individuals to be less stressed<sup>17</sup>; and when individuals are less stressed, they make more sensible decisions and communicate better, thus improving their mental health. However, it is also apparent that green space may improve the mental health of individuals by improving their social capital. One study, for instance, conducted by Kweon (1998)<sup>18</sup>, found that green space acts as a meeting place for users to develop and maintain social ties, and this social interaction enhances the social communication and personal skills of the users<sup>19</sup>. Further, this formation of social ties within green spaces in urban areas,

has also been found to significantly contribute towards residents' sense of safety and adjustment<sup>20</sup>, which, as will be discussed, are extremely influential factors in the decision to utilise available green space.

However, and as was stated within the introduction, the vast majority of literature and research which has aimed to explore the links between green space and mental health have derived predominantly qualitative or 'grey literature' resources, of which the quality is varied<sup>21</sup>. Despite the inherent difficulties in quantifying non-physical health benefits, much quantitative research is needed on this area to test and improve upon findings and conclusions made by some of the previous mentioned studies. The relationship between mental health and green space, however, is more heavily emphasised in research which focuses solely on the health benefits of blue space (water).

### Water

Although the amount of literature which focuses specifically on the health benefits of water space is considerably less than that of a generalised green space, some relationships are found throughout this research<sup>22</sup>. Most commonly, the benefits that arise from water-based green space surround its ability to reduce stress<sup>23</sup>. One of the most prominent authors within this area, Nichols, argues that water is highly beneficial for mental health. For instance, within his book 'Blue Mind: How Water Makes You Happier, More Connected and Better at What You Do' (2014),<sup>24</sup> Nichols states that: 'a middle meditative state characterised by calm, peacefulness, unity and a sense of

general happiness and satisfaction with life in the moment' is triggered when humans come into contact with water. Nichols argues that when we are on, in, or under water, we get a cognitive break as less information is being processed through the brain. The 'mindful' state that this creates benefits the mind and body on a number of supposed different levels. The myriad of benefits from this include: lower stress levels, relief from mild anxiety and depression, clearer mental clarity and focus and better sleep quality. Thus, research suggests that being surrounded by blue space helps us relax; hence improving our mental health.

It has also been found in some literature that there are unique characteristics of a waterside environment- such as canals that have the potential to enable interventions for mental health support and deliver additional benefits for psychiatric recovery programmes<sup>25</sup>. Further, it has been reported by news outlets, that Canal walks are being 'prescribed by GP's to combat depression' as they reduce stress and 'help people deal with low mood and loneliness', providing what has deemed a 'natural health service'<sup>26</sup>.

However, authors such as Calogiuri and Chroni (2014)<sup>27</sup> suggest that there is limited understanding of which aspects of nature (such as green space and blue space) deliver which health benefits (such as mental health benefits), and thus, there is inherent difficulty in integrating such findings into health policy effectively.

Therefore, through the above discussion it can be seen that literature is inconclusive on the benefits of green (and blue) space on both physical and mental health, with some articles emphasising that there are

important, often demographic factors that influence the relationship between green (and blue) space and benefits to health. Similarly, literature emphasises the same relationship between green (and blue) space and mental health.

### **Influential Factors in Green Space Use**

Hence, although existing literature makes it clear that green (and blue) space are somewhat associated with improved physical and mental health, it is clear there are influential factors involved in determining whether a green space is actually beneficial for an individual's health. These can be placed into two distinct categories: the accessibility, quality and availability of the green space, and the demographic make-up of the individual wanting to use the green space; including their age, gender and socio-economic status. The second half of this briefing will, thus, look to provide a narrative of the influential factors in green space use. It will begin with discussing the importance of accessibility, quality and availability and then will look to demographic factors, namely age, gender and socio-economic status.

#### ***Accessibility***

A lot of research states that individuals with good access to green space are more likely to use it<sup>28</sup>, with studies noting that there is an association between the ease and convenience of access with physical activity and leisure-influenced physical activity. One study, for instance, found that individuals who were able to access green space, by having residential proximity, were more likely to achieve the standard, recommended

levels of physical activity compared to those who were converse to them, and this is a seemingly common theme within literature. For instance, a study conducted in the USA by Cohen et al., (2006)<sup>29</sup> found that adolescent girls living near a green space (within 0.5 miles) were more likely to engage in more physical activity which was not guided by their school. Similar conclusions were also researched in other articles, where the frequency of green space use declined with increased distance from green space<sup>30</sup>. The accessibility of green space within select literature is noted to have an effect on physical health with one article finding that participants living closer to the green space reported that they had higher levels of physical activity and were, on observation, less likely to be obese<sup>31</sup>, and another argued that a proximity to green space be associated with better self-reported health<sup>32</sup>.

It must be noted, however, that whilst many studies conclude with an association between the use of green space and its accessibility, it remains contested. A British Study, for example, failed to arrive at this conclusion, and stated that the associations that were found in previous research 'appear to be restricted to specific types of green spaces and walking or cycling behaviour'<sup>33</sup> and, thus, did not actually provide a full explanation for the relationship.

#### ***Quality and availability***

The other commonly drawn upon factor in literature, which is argued to influence green space use is its quality and availability; including both the upkeep of the space and the availability

of features which may be beneficial for individuals<sup>34</sup>. Some research has stated that individuals commonly decide on whether or not to use a green space based on its features; what it can provide them; and the condition that it is in. Some articles, for instance, suggest that places in which green space has little or no upkeep and are classed as being in 'disrepair' are less likely to attract visitors and to be visited, while also contributing to a subjective sense of a lack of safety<sup>35</sup>. Other studies which have also reported on this relation and have shown that the upkeep of the green space negatively affects its probability of being used<sup>36</sup>. In specific, one article stressed that the quality of a green space is an especially prominent factor for disabled children and young people and their parents, and whether they decide to visit and use a green space and its facilities<sup>37</sup>.

### Age

Within the literature, the relationship between age and green space is seemingly consistent, with the vast majority of studies concluding that older persons are more infrequent users of green space<sup>38</sup>, and that young adults are more consistent participants in leisure-time physical activity in the presence of green space. Despite this conclusion, one article which focused on young people and green space use found that in some areas, teenagers may avoid using a green space due to the possibility of experiencing a hostile attitude to an inferred association with vandalism and crime within the public space. This finding could explain why young people, and mainly teenage girls, despite spending more time in green space than older people, are spending

less time participating in physical activity (with studies estimating that between the ages of fifteen and eighteen, participation in physical activities falls by up to 37%)<sup>39</sup>. When looking at older people's use of green space, some literature suggests that older people have reduced levels of physical function and a lower pattern of outdoor activity, and thus, different levels of exposure and access to green space<sup>40</sup>.

### Gender

Gender differences in green space use are also reported in the literature. Most commonly and put simply, the relationship is as follows: males use green space more often than females<sup>41</sup>. Males, for instance, are noted in one article to be twice as likely to be vigorously active within green space areas, whilst females more likely to use green space to walk 'purposefully' rather than for exercise<sup>42</sup>. Similarly, one study stated that women see greater aesthetic value and have higher wellbeing associated with green space<sup>43</sup>. Furthermore, an article conducted by Richardson and Mitchell (2010) hypothesised that green space is more important for men's health than women's due to the fact they are more likely to use it for vigorous activity<sup>44</sup>. This particular article found that, for women, the neighbourhoods environment (including the amount of available green space) was important as they spend more time in their neighbour than men (due to the fact they are more likely to work part time or to be supervising children).

However, in an article published in 2012, Omoleke<sup>45</sup> argues that indications from literature also suggest that fear

and safety concern, gender role and socialisation processes may play an influential role in the relationship between green space use and gender, thus pointing towards a complicated, under-researched area. In fact, this article also acknowledges that there is need for further research to investigate the relationship between frequency of use and use of space and gender in order to improve the effectiveness of each mechanism to improve health<sup>45</sup>.

### **Socioeconomic status**

Accessibility and exposure to green spaces, according to select literature, may reflect socioeconomic health inequalities and hence, influence who uses green space and why. Some research, for instance, has found that those who live in inner cities or disadvantaged neighbourhoods, are less likely to participate in outdoor recreational activities actively<sup>46</sup>. For example, one study, conducted by Babey (2007)<sup>47</sup>, found that teenagers living within disadvantaged neighbours lacked access to parks which were subjectively deemed as 'safe' and thus, were less likely than their more affluent counterparts, who deemed their parks as 'safe', to participate in physical outdoor activities. The relationship between socioeconomic status and green space is also stressed by Panter (2008)<sup>48</sup>, who found that individuals in low-income households were more likely to partake in low levels of activity and were least well served by so-called 'affordable facilities'. On the other hand, individuals who were deemed to be affluent were more likely to reside in close residence to facilities of any type.

Although this may represent a fundamental way through which to hypothesise how socioeconomic status affects green space use, it is well worth considering the confounding factors, such as individual choice and lifestyle, which could have a significant amount of influence on health status and green space use, but of which literature is limited.

Therefore, although it can be asserted that green and blue space have, although disputed, effects on physical and mental health, it is clear that there are factors which can influence who uses a green space and how it is used, and such things must be considered when looking to understand the relationships between green space and wellbeing.

### **Conclusion and Recommendations**

It can thus be asserted that the health benefits that can arise from the use of green space are complex and dependent on a range of factors. Those looking into developing a green space for the use of individuals, be it to increase exercise activity or to increase social capital, must consider the different factors that may influence how green space is used. Namely, those who are looking to develop green spaces should consider its proximity to residents; its perceived safety; and whom they are developing it for and why. These factors may influence who might use the green space, and for what reasons. Regarding demographics, urban developers should look to develop green spaces which are usable for all age groups and genders; as, although research is inconsistent with these associations, it is hypothesised that these different demographics will hold

different reasons for using, or not using, green spaces. Due to the inconsistency of the literature surrounding this particular topic, it should be of consideration for urban developers to include the opinions and ideas of residents in its development as so to fully understand the unique experiences and wants of those who may use the green space.

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