



# Domains and levels of physical activity are linked to adult mental health and wellbeing in deprived neighbourhoods: A cross-sectional study



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## ABSTRACT

Although relationships between participating in physical activity (PA) and positive mental health and wellbeing are well established, little is known about the relative contributions of the different domains of PA—household, occupational, active travel, leisure and sport, family activities—to total PA and, in turn, to mental health and wellbeing. This is particularly important for deprived communities where PA is low and mental health and wellbeing poor.

Using multivariate multilevel regression of cross-sectional survey data collected in 2011, we examined self-reported PA levels and the domains and diversity of sources of PA among 2654 residents of 32 deprived neighbourhoods in Glasgow, UK, and their associations with measures of mental health, positive mental wellbeing, and physical and general health.

Household chores and active travel were the most commonly cited PAs. People achieving PA from family activities, and those doing more diverse PAs, had better mental wellbeing. Active travel was associated with better mental wellbeing and mental health among the highly and moderately physically active, respectively. Highly active people who engaged in leisure-based PA had better mental health. Long-standing illness was associated with worse health scores, although mental wellbeing was ameliorated amongst those who did domestic or occupational PA.

It is important to encourage greater diversity of PA in disadvantaged areas, including leisure and family activities and active travel for those out of work with low PA. Nevertheless, interventions aimed at managing long-term health conditions and providing employment may be of even greater importance.

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## 1. Introduction

The potential benefits of physical activity (PA) not only for alleviating and preventing poor mental health (Mammen & Faulkner, 2013), but also for encouraging positive mental wellbeing (Cerin, Leslie, Sugiyama, & Owen, 2009) are well established.<sup>1</sup> The PA targets recommended by health organisations and governments since

the 1970s (Blair, LaMonte, & Nichaman, 2004) for improving and maintaining physical and mental health are underpinned by a concern for reaching or exceeding a total level of energy expenditure from doing PA. Although it is recognised that this involves activities done in various contexts and combinations of intensity, duration and frequency, public health messages focus more on total activity levels (e.g., Scottish Government, 2013) than on the activities by which they are achieved. Four domains of activity are customarily distinguished in the literature: household; occupational; active travel/transport; leisure-time (including sport). These domains may make distinct contributions to overall PA but relatively little is known about their differential contributions to mental health and positive mental wellbeing, although there is reason to expect that not all domains of PA will be positive for mental health and wellbeing. We review the current evidence of the varied links between PA domains and mental health and wellbeing (and, to a lesser extent, physical health), and the gaps in our knowledge.

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<sup>1</sup> In this paper, we use the term 'mental health' to mean primarily the absence of mental ill-health and psychological problems. Positive mental wellbeing is understood as being a latent characteristic comprising hedonic (experiencing positive affect) and eudaimonic (living well and fulfilling potential) components of experience. The term 'mental health and wellbeing' is used throughout to refer collectively to 'mental health' and 'positive mental wellbeing'.

Doing household PA has been associated with poorer mental health and wellbeing in some groups of women (Asztalos et al., 2009; Cerin et al., 2009), but doing 'a lot' of domestic PA has been identified as the activity most strongly associated with self-reported happiness (assessed from a single question in the SF-36 Health Survey questionnaire) across all PA domains (Richards et al., 2015). Doing housework has been linked to a lower risk of psychological distress (assessed using the GHQ-12) (Hamer, Stamatakis, & Steptoe, 2009), and to lower psychological stress, estimated from the GHQ-12 and SCL-90-R, among young adults with non-manual jobs (Asztalos et al., 2009).

The few known associations of occupational PA with mental health and wellbeing portray a mixed picture. One study noted a positive association with depression in Australian women, measured with the Composite International Diagnostic Interview (McKercher et al., 2009), while another used the Psychological Well-being Index Short Form to demonstrate poorer mental wellbeing among adult men who performed vigorous occupational PA (Kim, Shin, Nam, Choi, & Kim, 2008). Still others have found no relationship (e.g., Harvey, Hotopf, Øverland, & Mykletun, 2010; using the Hospital Anxiety and Depression Scale). Similarly, links between occupational PA and physical health may be positive (Hu et al., 2007), detrimental (Krause, Brand, Arah, & Kauhanen, 2015) or non-existent (Sisson et al., 2009).

Active travel (typically, walking or cycling to work or school) also has mixed associations with mental health and wellbeing. Hansson, Mattisson, Björk, Östergren, and Jakobsson (2011) found better sleep quality, lower stress and greater vitality (SF-36 Vitality scale) in active commuters compared with car commuters. Conversely, Asztalos et al. (2009) noted that male blue-collar employees who commuted by bicycle felt more stressed than those who did not actively travel. Cerin et al. (2009) found no association between transport PA and mental wellbeing measured with the SF-12 MCS-12, except among the obese. Positive associations between active travel and physical health have been more consistently demonstrated (e.g., Bassett, Pucher, Buehler, Thompson, & Crouter, 2008; Lubans, Boreham, Kelly, & Foster, 2011; Shephard, 2008), although too much active commuting may reverse such benefits (Hu et al., 2002).

Leisure-time PA (including sports) is the most widely studied domain, and has been shown to alleviate depression (assessed with the Center for Epidemiological Studies Depression Scale; Chen, Stevinson, Ku, Chang, & Chu, 2012) and to be associated with being happy more often (Richards et al., 2015). We have identified no examples in the literature of leisure-time PA being detrimental to mental health and wellbeing. Its benefits to physical health are even more firmly established (e.g., pancreatic cancer, Farris, McFadden, Friedenreich, & Brenner, 2015; long-term sickness absence, Holtermann, Hansen, Burr, Søgaard, & Sjøgaard, 2012), negative associations between physical health and leisure-time PA being rarely reported (e.g., coronary heart disease, Clays et al., 2013).

It is also plausible that engaging in a more diverse range of activities is associated with higher rates of overall PA and, subsequently, better mental health and wellbeing. We know little about whether the diversity of PAs *per se* is associated with achieving higher total levels of PA; a study of British 10-year-olds by Brooke, Corder, Griffin, Ekelund, and van Sluijs (2013), is an exception in showing that children achieving at least the recommended levels of PA engaged in a wider variety of activities than those who did not. To the best of our knowledge, no studies have sought links between the diversity of PA (e.g., as might be indicated by the number of PA domains from which people gain their PA) and its possible health consequences, although Curl, Ward Thompson, Alves, and Aspinall (2016) established that older adults who engaged in a greater

number of outdoor activities reported higher levels of life satisfaction.

Overall, levels of PA tend to be lower in deprived areas. In Scotland as a whole, 40% of people in the most deprived quintile of neighbourhoods claimed to do low levels of PA, compared with 27% of those from neighbourhoods in the least deprived quintile (Scottish Government, 2012). In the study reported here, 47% respondents reported doing little or no PA. Likewise, area deprivation has often, if not always, been associated with poorer mental health (Fone et al., 2007; Stevenson, Pearce, Blakely, Ivory, & Witten, 2009) as well as poorer physical health (Marmot & Bell, 2012). Certainly, relatively low levels of mental wellbeing and poor physical health are associated with greater area deprivation in Scotland overall (Wilson, Kellock, Adams, & Landsberg, 2015, pp. 33–34) and in the areas studied here (GoWell, 2010).

Research has identified many of the residential, neighbourhood and community characteristics that influence people's propensity to undertake PA (e.g., Bauman et al., 2012), including in deprived urban areas (Ogilvie, Mitchell, Mutrie, Petticrew, & Platt, 2008), where levels of PA or participation in health-promoting PAs (Kavanagh et al., 2005; Rind & Jones, 2011) are often particularly low. We have previously investigated aspects of PA in a large sample of deprived neighbourhood residents in Glasgow (Scotland, UK) as part of a broader study of the effects of residential and neighbourhood change and regeneration on health and wellbeing (Mason & Kearns, 2013; Mason, Kearns, & Bond, 2011; Mason, Kearns, & Livingston, 2013). However, this has rarely been considered alongside the types of PA people do, and whether these distinct domains of PA can have different consequences for mental health and wellbeing. However, Shortt, Rind, Pearce, and Mitchell (2014) found that walking for recreation was more common in less deprived areas and walking for transport more common in more deprived areas, but postulate that non-recreational walking may not have the same health effects. Furthermore, active travel may be more common among more deprived populations (Goodman, 2013). Thus, it is important to establish whether these more functional forms of PA have positive health and wellbeing outcomes, given their prevalence among deprived populations who may benefit from the health effects of increased PA.

The mental health of residents in deprived areas tends to be worse than those of less deprived neighbourhoods. For example, in Scotland in 2011–2012 there were more than twice as many mental health inpatients in hospitals, and more than three times as many such patients discharged who were from the most, compared with the least deprived quintile of areas (ISD, 2015, p.20). Likewise, measures of positive mental wellbeing (WEMWBS, GCH-12 and life satisfaction) were significantly worse among people from the most deprived 15% areas of Scotland compared with the rest of the country in 2010 (Scottish Government, 2011). In addition, many aspects of physical and general health tend to be worse in these deprived areas (Scottish Government, 2015). Since the greatest need for PA interventions for health is among the least active, we may seek to understand what activities comprise the PA of those who are currently relatively inactive, and compare these with equivalent behaviours of the more active portion of the population.

Other characteristics of the people in our sample, such as the disproportionately large numbers of those without work, with long-term health conditions or with few educational qualifications are all associated with worse mental health and wellbeing (Wilson et al., 2015). Therefore, it is reasonable to surmise that there may be considerable scope to improve the mental and physical health of residents of these types of neighbourhoods through interventions that enable them to do more PA.

Through analyses of cross-sectional data from a study of urban

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