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RESEARCH ARTICLE

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# Is concern about young people's anti-social behaviour associated with poor health? cross-sectional evidence from residents of deprived urban neighbourhoods

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## Abstract

**Background:** Young people in disadvantaged neighbourhoods are often the focus of concerns about anti-social behaviour (ASB). There is inconsistent evidence to support the hypothesis that perceptions of ASB (PASB) are associated with poor health. We ask whether perceptions of young people's ASB are associated with poor health; and whether health, demographic and (psycho)social characteristics can help explain why PASB varies within disadvantaged neighbourhoods (Glasgow, UK).

**Methods:** Regression analysis of survey data exploring associations between perceiving teenagers hanging around to be a serious neighbourhood problem and SF-12v2 mental and physical health scores (higher = better), including adjustment for demographic characteristics. Further analysis explored associations with self-reported measures of health service use, psychosocial characteristics of homes and neighbourhoods and social contacts.

**Results:** 6008 adults participated (50% response) and 22% (n = 1,332) said teenagers were a serious neighbourhood problem (the most frequently reported local problem). Demographic characteristics associated with perceiving serious teenager problems included regular health service use, age (inverse relationship), financial problems and living with children. Lower SF-12v2 physical health scores were associated with perceiving teenager problems after adjustment for demographic variables (OR 0.98; 95%CI 0.97,0.99;  $p = < 0.001$ ), whilst adjusted findings for mental health scores were less conclusive (OR 0.99; 95%CI 0.98,1.00;  $p = 0.103$ ). Further analysis suggested that perceiving teenager problems was more strongly associated with a number of self-reported psychosocial factors: e.g. lacking social support, < weekly family contacts, poor neighbourhood safety, low trust in neighbours, neighbourhood perceived to be a barrier to self-esteem, and neighbourhood decline.

**Conclusions:** Given the evidence we found of weak and small associations between PASB and health, we caution against assuming that tackling concern about teenagers' ASB will lead to substantial public health gains in disadvantaged areas. Although the findings do not present a compelling case for making PASB a public health priority, it is still important to address concerns about young people's ASB. Reasons for doing so may include improving social cohesion, reducing fear and isolation, and improving the general quality of people's lives - particularly in neighbourhoods burdened by multiple disadvantages. Future research should evaluate interventions that attempt to reduce PASB in disadvantaged areas. Findings from this study could help inform the targeting of such interventions.

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## Background

Young people's anti-social behaviour (ASB) is a policy priority [1-3]. A recent literature review has illustrated the growing interest amongst researchers in perceptions of ASB (PASB), as distinct from the direct experience of ASB or crime [2]. Some researchers have also theorised that concerns and fears associated with crime and ASB may be associated with poorer health and social inequalities in health [4-13]: in this way, PASB is considered to be a public health issue.

Definitions of ASB vary but examples include malicious behaviour aimed at individuals and groups, acts of vandalism or carelessness that degrade the local environment, and threatening or physically obstructive behaviours that deter other people from using/accessing public spaces [2,14,15]. Many of these behaviours are also crimes and indeed the UK 1998 Crime and Disorder Act explicitly criminalised ASB, defining it as "acting in a manner that caused or was likely to cause harassment, alarm or distress" [16]. This definition is not age-specific but policy documents [1,3,17], newspaper reports [18] and household survey findings [15,18-21] show that ASB is frequently linked to young people, particularly in disadvantaged areas. Furthermore, crime statistics consistently show that a disproportionately high percentage of crimes associated with ASB are committed by people (especially males) aged in their mid to late teens and early 20s [22,23].

Due to difficulties in objectively measuring anti-social incidents, there is little evidence on the relationship between perceived and 'actual' ASB [2]. However, a US study concluded that observed environmental disorder such as vandalism is spatially associated with perceived disorder, but contextual factors (in that study, particularly the neighbourhoods' ethnic composition) had stronger associations [24,25]. Findings on the importance of contextual factors have been incorporated into arguments that PASB is a symptom of poor social cohesion and negative stereotyping, rather than a purely rational response to actual ASB [2].

This theorized link between PASB and negative stereotypes means that focusing on young people's ASB can be controversial. The United Nations Committee on the Rights of the Child has expressed concern that public perceptions of young people's ASB are part of a "general climate of intolerance and negative public attitudes towards children, especially adolescents" in the UK [26] (p.6). On the other hand, a recent report on Scottish attitudes towards ASB concluded that "given evidence from elsewhere that much ASB is indeed committed by young people (but not that most young people commit ASB), it is difficult to say whether this... perception reflects a stereotypical or a realistic view of young people" [27] (p.iv).

## PASB and health

Irrespective of whether one leans towards the 'realistic' or 'stereotypical' interpretation of PASB, there is evidence to show that concern about ASB and crime may have an adverse impact on people's quality of life [11]. People who worry about ASB and crime may become constrained in their use of public spaces [28,29], or may withdraw from social life and avoid going out, especially at night [30,31].

Several studies also suggest that residents living in disadvantaged or deprived neighbourhoods, or neighbourhoods perceived by residents to have poor reputations, are particularly likely to be concerned about crime, ASB and neighbourhood safety [19,20,32]. However, some studies have found that the association between deprivation and PASB prevalence appears to vary between and within disadvantaged populations: i.e. some disadvantaged neighbourhoods appear to be more resilient (i.e. have a relatively low prevalence of concerns about ASB) than others, and some residents of such neighbourhoods appear more resilient than their neighbours [2,33,34].

The evidence linking health with PASB also provides some mixed messages. With regards to mental health, a US study of Black and Hispanic women and children found associations between perceived crime and mental health to be weak and inconsistent [35]. Weich et al. found that associations between depression and neighbourhood graffiti were not statistically significant after adjusting for individual and household-level risk factors [36]. However, a study of adults residing in tower blocks found that fear of crime was associated with low mental health scores derived from the SF-36 (Short Form 36 questionnaire) [7]. A Scottish study found evidence that residents who perceived high levels of neighbourhood incivilities (e.g. litter and graffiti) were particularly likely to report frequent feelings of anxiety and depression [37]. Furthermore, longitudinal analysis of UK civil servants found that fear of crime was associated with poorer mental health, along with reduced physical functioning, lower social engagement and lower quality of life [38].

With regard to physical health, a literature review identified some evidence that worrying about crime and/or ASB is associated with reduced physical activity but the reviewers also identified evidence that was inconsistent with this finding [39]. Miles et al. found that neighbourhood disorder was associated with women's (but not men's) infrequent involvement in sports, whilst perceived safety was not associated with physical activity for either men or women [40]. Mason et al. found that physical activity (walking around the neighbourhood) had inconsistent associations with perceptions of poor neighbourhood safety at individual and neighbourhood levels [41]. Analysis of British Crime Survey data has found PASB to

be associated with longstanding illness [20], whereas the Scottish Social Attitudes Survey found no significant association between these variables [27].

A key issue for this paper is that relatively few studies have focused particularly on associations between health and perceptions of young people's ASB. One study of walking habits amongst older people used an unflattering composite measure of 'nuisance' that combined young people hanging around with unattended dogs and dog-fouling, and found that low nuisance was associated with more walking [42]. The British Crime Survey found that self-reported long standing illness was associated with a greater likelihood of perceiving teenagers hanging around to be a neighbourhood problem (as was living in a relatively deprived area) after controlling for potential confounding variables [20].

### Study aims

Testing associations between PASB and health can help us better understand the extent to which concern about young people's behaviour in deprived neighbourhoods should be treated as a public health issue. Improving our understanding of *who* thinks teenagers are a problem is also a useful first step for planning targeted interventions for supporting people from deprived neighbourhoods who are particularly vulnerable to fear of crime and disorder. For example, an association between poor physical or mental health and PASB could potentially be used as evidence to support the feasibility of using health care settings in deprived areas for targeted interventions addressing PASB (of course, evaluations would then be required to measure the effectiveness of any intervention).

In this study we used cross-sectional data from a survey of residents living in disadvantaged urban neighbourhoods to ask (question 1) *are adults with poor health more likely to think young people's ASB is a problem in disadvantage neighbourhoods?* We also invert that question and ask (question 2) *do adult residents who perceive young people's ASB to be a problem in disadvantaged neighbourhoods have worse health than people who are less concerned about young people's ASB.*

The findings have been adjusted to take into account demographic characteristics of residents. As PASB has also been associated in the literature with psychosocial factors such as poor neighbourhood reputation and poor social cohesion [28-32] we have conducted further analysis to explore whether individual-level psychosocial characteristics can help explain why PASB varies within disadvantaged neighbourhoods.

A key strength of this study is that it focuses specifically on perceptions of young people's ASB in disadvantaged neighbourhoods: i.e. it focuses on the social group most frequently linked to ASB, in the kinds of neighbourhoods where previous studies have found residents are

most likely to view young people's behaviour as problematic. We have measured physical and mental health using a short well-validated questionnaire (SF-12v2). We are aware of no other quantitative study that looks at both physical and mental health in relation to perceptions of young people's ASB, or that focuses on perceptions of young people's ASB in disadvantaged urban areas.

### Methods

This study is based on analysis of survey data collected for a research and learning programme called GoWell [43]. The study received ethical approval from NHS Scotland B MREC committee in 2005 (no. 05/MRE10/89).

### Setting

We surveyed 14 disadvantaged neighbourhoods in the city of Glasgow (UK). Two of the neighbourhoods were peripheral estates consisting mainly of houses with gardens and common entry three/four story flats (tenements). The other neighbourhoods had inner-city locations: five had a 'gardened suburb' design characterised by houses (including house-like structures containing private entry flats) with gardens; seven were mass housing estates dominated by high rise flats.

All the neighbourhoods fell well below the Scottish Index of Multiple Deprivation lowest 15% income deprivation cut-off that is used to define area poverty by the Scottish Government [44]. Around one-in-four homes were owner-occupied and the rest were rented (virtually all from government-regulated providers of social housing) [43].

### The survey

Data were collected in 2006. Addresses were selected at random, although in some smaller neighbourhoods all residential addresses were selected. One adult householder (aged 16 years or over) per household was randomly sampled and, subject to the provision of informed consent, participated in a face-to-face interview. Full details of the questions asked have been published in the GoWell protocol [43]. The items relevant to the PASB analysis are described in Additional File 1.

### PASB measure

PASB was assessed using a question adapted from the British Crime Survey asking participants if they thought 'teenagers hanging around on the street' constituted a problem in their local neighbourhood [20], defined as the local area within a 5-10 minute walk of their home. In the survey questionnaire, this was one item in a list of 17 neighbourhood problems (see Additional file 1). We were interested in more serious instances of PASB, so our analysis compared residents who identified teenagers as a

'serious problem' with those who did not (collapsing 'not a problem', 'slight problem' and 'don't know' responses into the reference category). This was our dependent variable for research question 1 (see Aims and Objectives, above).

### Health variables

GoWell's two primary health outcomes were the physical and the mental health scores derived from SF-12 version 2 [45]: a validated questionnaire often used in studies of residents living in disadvantaged areas [46]. SF-12v2 physical and mental health composite scores are computed using the scores of twelve questions and range from 0 to 100, where a zero score indicates the lowest level of health measured by the scales and 100 indicates the highest level of health. These scores were our dependent variable for research question 2.

We also included as secondary health outcomes two variables on health service use in the previous 12 months: number of general practitioner (GP) visits, and number of GP visits for a psychological problem. These were included to further explore whether or not attempts to reduce PASB might feasibly target frequent health service users.

### Other variables

Following a scoping of previous surveys and related literature we developed a list of demographic, social and psychosocial characteristics that we hypothesised could be associated with PASB [15,20,33,47,48]. Variables relevant to these characteristics were derived from items in the GoWell questionnaire, which generally took the form of structured questions with 3, 4 or 5 point Likert-type scales for self-reported responses. Most of these questions were taken from national and local surveys - these surveys were often not formally validated but have been selected because they are routinely used and provide benchmark findings from which we can compare outcomes. Some questions were developed by GoWell and piloted for ease of delivery and response. Further details about the questions can be found in Additional File 1. The other variables we included are summarised below.

*Demographic characteristics* included gender, ethnicity, age, household structure, education and problems paying bills.

*Psychosocial characteristics* were conceptualised as characteristics that 'bridge' individual and environmental factors by indicating how people feel about their environment[49,50]. We included a number of neighbourhood psychosocial variables relating to social cohesion, including neighbourhood reputation, safety, tolerance, trust in neighbours, feeling of belonging to the neighbourhood, self or collective efficacy regarding local decision-making, feeling that neighbours would intervene informally to

prevent ASB, how neighbourhoods affected participants' self-esteem; social contact, social support and proxies for social exposure to the neighbourhood (length of residence, speaking to neighbours, taking walks around the neighbourhood). We also included variables from questions about participants' home psychosocial environments: privacy, control, safety and self-esteem related to the home.

### Analyses

Using Stata/IC 11.1 [51] we ran bivariate analysis of response data for each of the independent variables. We conducted multivariate logistic regression to model associations between the *demographic characteristic* variables and the dependent variable for question 1 (teenager problems). We then conducted multiple regressions to model associations between the dependent variable and each of the two health variables, adjusting for demographic characteristics. To avoid over-adjustment (e.g. having one health variable adjusting for another health variable), this involved 2 separate regression models (one for SF12v2 physical health scores and the other for SF12v2 mental health scores).

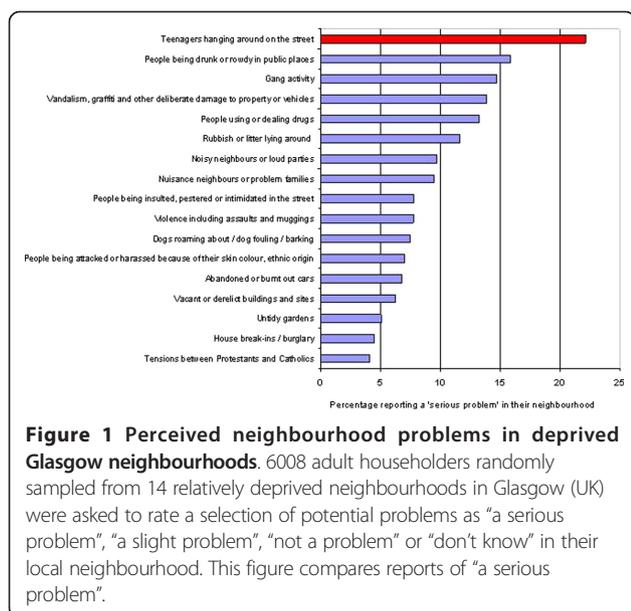
To answer question 2, we used bivariate and multiple regressions with teenager problems as the independent variable (adjusting for demographic characteristics in the multiple regression models), whilst SF-12v2 physical health score and then SF12v2. mental health score were dependent variables. We explored effect sizes based on standard deviations using Cohen's suggested interpretations of Cohen's  $d$ :  $d = 0.2$  be considered a 'small' effect size, 0.5 represents a 'medium' effect size and 0.8 a 'large' effect size [52].

Further analysis involved multiple regression models of social and psychosocial variables adjusting for the demographic and health related variables. Teenager problems was the dependent variable. Given the relatively large number of variables in the final model, we carried out a Bonferroni correction which is considered to be a conservative approach to reducing the risk of false positives from multiple comparisons [53].

In all the multiple regression models, 95% confidence intervals (CI) were based on robust standard errors which take account of the non-independence of respondents from the same area, thereby accounting for neighbourhood level effects.

### Results

6,008 completed responses were collected with an overall survey response rate of 50.3%. From the list of 17 types of neighbourhood problems put to survey respondents, 'teenagers hanging around on the street' was the most commonly reported problem (see Figure 1). Twenty-two percent ( $n = 1,332$ ) of participants said this was a serious



**Figure 1 Perceived neighbourhood problems in deprived Glasgow neighbourhoods.** 6008 adult householders randomly sampled from 14 relatively deprived neighbourhoods in Glasgow (UK) were asked to rate a selection of potential problems as “a serious problem”, “a slight problem”, “not a problem” or “don’t know” in their local neighbourhood. This figure compares reports of “a serious problem”.

problem (a further 32% answered ‘slight problem’, 43% ‘not a problem’ and 3% ‘don’t know’). Hence, in the following analysis we state that 22% of participants identify teenagers as a serious problem, whilst 78% do not report teenagers to be a serious problem.

### Demographic level characteristics

Table 1 summarises our multivariate regression model showing independent associations between demographic characteristics and perceiving teenager problems. Participants from all age categories under 65 years were more likely than people from the oldest age group to perceive teenager problems (p values ranged from 0.007 for 55-64 year olds, to < 0.001 for 16-24, 40-54, and 25-39 year olds). Perceiving teenager problems was also associated with living with children (OR 1.18; 95%CI 1.00,1.39;  $p = 0.049$ ) and having problems paying bills (OR 1.43; 95%CI 1.11,1.85;  $p = 0.005$ ). Findings for sex, ethnic group household structure and educational qualifications were inconclusive.

### Health

Table 2 addresses our first primary research question. Teenager problems is the dependent variable and the independent variables include the SF-12 mental and physical health scores. Mental health scores were not found to be independently significantly associated with perceived teen problems after adjustment: OR 0.99 (95%CI 0.98, 1.00;  $p = 0.103$ ). Lower physical health scores were found to be associated with perceiving teenager problems after adjusting for demographic characteristics: OR 0.98 (95%CI 0.97, 0.99;  $p < 0.001$ ).

Table 3 addresses research question 2. The SF-12v2 scores are the dependent variables and the independent

variables include teenager problems. We found that teenager problems were associated with physical health scores (coef = -1.69; 95%CI -2.87, -0.52;  $p = 0.008$ ) but there was little association with mental health scores (coef = -0.90; 95%CI -2.10, 0.31;  $p = 0.133$ ) after adjusting for demographic variables. Cohen’s d was 0.06 and 0.09 for SF12v2 physical and mental health scores respectively: according to Cohen’s criteria these are both small effect sizes [52].

### Psychosocial characteristics

Table 4 models associations between perceptions of teenager problems and variables relating to residents’ psychosocial environment, demographic characteristics, health and health service use. A Bonferroni correction was used to reduce the risk of type 1 error. People who felt unsafe going out at night, who felt low trust towards neighbours, who believed their neighbourhood did not encourage high self-esteem, reported that their neighbourhood had declined in the previous two years, lacked social support, and had less than weekly contact with relatives were all more likely to perceive teenagers hanging around to be a serious local problem ( $p < 0.001$  before the Bonferroni correction,  $p < 0.05$  after the correction). Similarly, participants who reported visiting a GP seven or more times in the last 12 months were significantly more likely to perceive teenager problems before and after the Bonferroni correction ( $p < 0.001$  and  $p < 0.05$ , respectively). The only demographic variable to remain significant after the correction was age: again (similar to Table 1), the findings reported in Table 4 suggest an inverse relationship between age and perceptions that local teenagers were a problem.

A number of variables were found to have a significant association with teenager problems before the Bonferroni correction but not after: i.e. 1 to 6 GP visits during last 12 months, GP visits for a psychological issue (last 12 months), neighbourhood reputation, contact with neighbours, walk around neighbourhood, and problems paying bills.

The remaining variables were not significant either before or after the correction. This includes the SF12v2 physical and mental health scores. To test whether the inclusion of multiple health outcomes in the model affected these findings, we ran two further versions of the model including only the mental health score and then only the physical health score (the models included psychosocial and demographic variables as before, but excluded health service use). Before the Bonferroni correction, the physical health score was associated with teen problems (OR 0.99 (95%CI 0.98, 1.00);  $p = 0.021$ ) when the other health variables were absent from the model. The mental health score was not significant before correction, and neither physical nor mental health

**Table 1 demographic characteristics of participants who report serious teenager problems: multivariate logistic regression model**

Dependent variable: Participants who report that teenagers are a serious problem						
Independent variables	Category	N <sup>1</sup>	% <sup>2</sup>	OR <sup>3</sup>	P <sup>4</sup>	95% CI <sup>5</sup>
Sex	<i>Male</i>	490	20.43	1.00		
	Female	842	23.32	1.15	0.071	(0.99-1.34)
Ethnic group	<i>White British</i>	1074	21.48	1.00		
	Other	257	25.73	0.91	0.533	(0.68-1.22)
Household structure	<i>Cohabiting</i>	489	23.37	1.00		
	Single	832	21.54	0.93	0.468	(0.77-1.13)
Age group (years)	<i>65 or older</i>	209	14.09	1.00		
	55 to 64	160	19.88	1.45	0.007	(1.10-1.90)
	40 to 54	373	24.21	1.75	< 0.001	(1.40- 2.19)
	25 to 39	437	26.52	1.90	< 0.001	(1.41-2.58)
Living with children	<i>16 to 24</i>	136	29.18	2.21	< 0.001	(1.49-3.27)
	No	794	19.53	1.00		
Educational qualifications	Yes	527	27.64	1.18	0.049	(1.00-1.39)
	<i>1 or more</i>	396	25.26	1.00		
Problems paying bills	None	936	21.18	0.89	0.203	(0.74-1.06)
	<i>Never</i>	936	20.40	1.00		
	Sometimes	396	27.89	1.43	0.005	(1.11-1.85)

<sup>1</sup> Number of participants from each category who report teenagers are a serious neighbourhood problem

<sup>2</sup> Percentage of participants from each category who report teenagers are a serious neighbourhood problem

<sup>3</sup> Odds ratio

<sup>4</sup> P value

<sup>5</sup> 95% Confidence interval

reference category in italics.

total sample n = 6008; number of observations = 5858.

scores were significant after the Bonferroni correction when the other health variables were absent from the model.

## Discussion

### PASB and health

In this study we used cross-sectional data to explore whether adults with poorer health (suggested by relatively low SF-12v2 scores) are more likely to think young people's ASB is a problem in disadvantage neighbourhoods;

and whether those residents who perceive young people's ASB to be a problem have relatively poor health (compared to other residents of disadvantaged neighbourhoods). These questions are closely related and have led to similar findings.

Focusing on the findings that were adjusted for individual demographic characteristics, our study suggests that physical health may have small independent associations with perceived teenager problems, whereas independent associations with mental health are weaker. However, the

**Table 2 Is health associated with perceiving teenagers to be a serious local problem? Bivariate (unadjusted) and multivariate (adjusted) logistic regression**

Dependent variable: Participants who report that teenagers are a serious problem							
Independent variables	Category or score direction	Unadjusted			Adjusted <sup>1</sup>		
		OR <sup>2</sup>	P <sup>3</sup>	95% CI <sup>4</sup>	OR <sup>2</sup>	P <sup>3</sup>	95% CI <sup>4</sup>
<b>Health</b>							
Physical health (SF-12 v.2 score)	Higher score = better	0.99	0.073	(0.99-1.00)	0.98	< 0.001	(0.97-0.99)
Mental health (SF-12 v.2 score)	Higher score = better	0.99	0.002	(0.98-1.00)	0.99	0.103	(0.98-1.00)

<sup>1</sup> Adjusted for sex, ethnic group, household structure, age group, living with children, educational qualifications, problems paying bills. To avoid over-adjusting for health-related outcomes, two separate multivariate logistic regressions were conducted for the two SF12v2 scores

<sup>2</sup> Odds ratio

<sup>3</sup> P value

<sup>4</sup> 95% Confidence interval

reference category in italics. Total sample n = 6008; number of observations = 5844

**Table 3 Is perceiving teenagers to be a serious local problem associated with mental and physical health? Bivariate (unadjusted) and multivariate (adjusted) regression**

Dependent variable	Independent variable	Unadjusted			Adjusted <sup>1</sup>		
		Coeff <sup>2</sup>	P <sup>3</sup>	95% CI <sup>4</sup>	Coeff <sup>2</sup>	P <sup>3</sup>	95% CI <sup>4</sup>
Physical health (SF-12 v.2) (higher = better)	Teenager problems <sup>5</sup>	-0.59	0.072	(-1.24 0.05)	-1.69	0.008	(-2.87 -0.52)
Mental health (SF-12 v.2) (higher = better)	Teenager problems <sup>5</sup>	-0.93	0.002	(-1.53 -0.33)	-0.90	0.133	(-2.10 0.31)

<sup>1</sup> Adjusted for sex, ethnic group, household structure, age group, living with children, educational qualifications, and problems paying bills

<sup>2</sup> Coefficients

<sup>3</sup> P value

<sup>4</sup> 95% Confidence interval

<sup>5</sup> Reporting teenagers hanging around to be a serious neighbourhood problem (reference category = not a serious neighbourhood problem)

Total sample n = 6008; number of observations = 5844

means differed by less than 0.2 standard deviations suggesting that the difference was likely to be trivial, even when statistically significant. This leads us to downplay the public health significance of associations between perceptions of young people's ASB and either physical or mental health.

Our final model did suggest that frequent GP visits were more consistently associated with perceptions of teenager problems (compared to the physical and mental health scores). We assume that the well-validated SF-12v2 scores are a more robust health measure than frequency of GP visits and that, consequently, GP visits may be influenced to a greater degree by unmeasured confounding factors. However, the findings on GP use could suggest that people in deprived areas who are regularly help-seeking (for a variety of reasons) are also more likely to perceive youth ASB problems: perhaps indicating a potential link between PASB and feelings of vulnerability. Frequent health service users may therefore be a potential target population for interventions that attempt to support those most vulnerable to PASB.

#### Demographic characteristics

We also explored the demographic characteristics of adults from disadvantaged areas who think that teenagers hanging around constitute a serious neighbourhood problem. In common with other studies [20,54], our findings suggested an inverse age relationship whereby residents belonging to our youngest age-category (16 to 24 year olds) were more than twice as likely to perceive teenager problems compared to the oldest age group (> 64 years). These findings are interesting in that they arguably run contrary to the pattern one would expect to see if PASB was primarily driven by intergenerational intolerance characterised by older adults' negative attitudes towards young people [26].

#### Psychosocial environments and social cohesion

Our findings suggests that people who perceive their psychosocial environment to be poor are more likely to be concerned about local teenagers compared to residents

who rate it more favourably. For a number of psychosocial variables, this relationship appears to be stronger than the relationship between poor health and PASB. Our analysis included psychosocial characteristics that can be considered dimensions of social cohesion. Several such characteristics appeared to be independently associated with teenager problems (i.e. perceptions that the neighbourhood is unsafe, in decline, that neighbours cannot be trusted and that the neighbourhood has an adverse effect on self-esteem). This is broadly in keeping with findings on perceptions of young people's ASB based on the British Crime Survey (BCS), although BCS analysis included fewer variables and did not focus on the characteristics of disadvantaged neighbourhoods [20].

Social isolation, in terms of low social support was also found to be associated with perceiving local teenagers to be a problem. However, the findings on social contact were to some extent inconsistent in that they suggested residents with regular contact with relatives were less likely to worry about teenagers, whereas regular contact with neighbours was associated with a greater likelihood to report PASB (although this latter finding was not significant after the Bonferroni correction). The association between PASB and frequent neighbour contact is in striking contrast to arguments that increased local engagement serves to raise levels of tolerance and reduce perceptions of inter-group problems within local areas [2]. It may be that in deprived areas, everyday contacts, if they include complaints about ASB or the area in general, may serve to raise awareness of local problems.

As we asked respondents about teenagers hanging around 'on the street', one might expect neighbourhood psychosocial environments to be more relevant to people's perceptions than home environments. Perhaps this reference to 'the street' helps explain why our measure of home psychosocial environments were not found to be independently associated with PASB.

#### Strengths and limitations

It is worth noting that this research was conducted prior to recent, well-publicised UK riots involving young people

**Table 4 Psychosocial, health and demographic characteristics of participants who report serious teenager problems: multivariate logistic regression model**

Variable	Category	Participants who report that teenagers are a serious problem				
		N <sup>1</sup>	% <sup>2</sup>	OR <sup>3</sup>	P <sup>4</sup>	95% CI <sup>5</sup>
<b>Health</b>						
Physical health (SF-12 v.2) Higher score = better	n/a	n/a	1.00	0.677		(0.99 -1.01)
Mental health (SF-12 v.2) Higher score = better	n/a	n/a	1.01	0.388		(0.99 -1.02)
<b>Health service use</b>						
Number of GP visits (last 12 months)	None	244	19.35	1.00		
	1 to 6	817	21.19	1.33	0.012	(1.06 -1.66)
	7 or more	271	30.52	1.98	< 0.001*	(1.40 -2.79)
Number of GP visits for a psychological issue (last 12 months)	None	969	20.11	1.00		
	1 or more	342	30.40	1.34	0.033	(1.02 -1.76)
<b>Individual</b>						
Sex	Male	490	20.43	1.00		
	Female	842	23.32	0.96	0.645	(0.82 - 1.13)
Ethnic group	White UK	1074	21.48	1.00		
	Other	257	25.73	1.24	0.105	(0.96 -1.60)
Household structure	Cohabiting	489	23.37	1.00		
	Single	832	21.54	0.92	0.335	(0.78 -1.09)
Age group (years)	65 or older	209	14.09	1.00		
	55 to 64	160	19.88	1.37	0.003	(1.11 -1.70)
	40 to 54	373	24.21	2.72	< 0.001*	(1.75 -4.23)
	25 to 39	437	26.52	2.10	< 0.001*	(1.54 -2.85)
Living with children	16 to 24	136	29.18	2.72	< 0.001*	(1.75 -4.23)
	No	794	19.53	1.00		
	Yes	527	27.64	1.16	0.109	(0.97 -1.39)
Educational qualifications	1 or more	396	25.26	1.00		
	None	936	21.18	0.88	0.133	(0.75 -1.04)
Problems paying bills	Never	936	20.40	1.00		
	Sometimes	396	27.89	1.39	0.004	(1.11 -1.73)
<b>Home Psychosocial Environment</b>						
Feel safe at home	Yes	1,219	21.6	1.00		
	No	113	31.04	0.92	0.621	(0.65 -1.30)
Feel in control at home	Yes	1,227	21.53	1.00		
	No	105	34.09	1.23	0.356	(0.79 -1.93)
Feel privacy at home	Yes	1,253	22	1.00		
	No	79	38	0.86	0.391	(0.60 -1.22)
Self-esteem from home	Yes	1,173	21.08	1.00		
	No	159	35.89	1.38	0.076	(0.97 -1.97)
<b>Participants who report that teenagers are a serious problem</b>						
Variable	Category	N <sup>1</sup>	% <sup>2</sup>	OR <sup>3</sup>	P <sup>4</sup>	95% CI <sup>5</sup>
<b>Neighbourhood Psychosocial Environment</b>						
Safe neighbourhood	Yes	825	18.43	1.00		
	No	507	33.09	1.94	< 0.001*	(1.66 -2.28)
Informal controls in neighbourhood	Yes	947	20.23	1.00		
	No	385	29.01	0.92	0.472	(0.73 -1.16)
Good neighbourhood reputation	Yes	154	14.47	1.00		
	No	1,178	23.83	1.45	0.033	(1.03 -2.05)
Tolerant neighbourhood	Yes	1,120	21.92	1.00		
	No	212	23.61	0.75	0.096	(0.53 -1.05)
Trust neighbours	Yes	700	18.13	1.00		
	No	632	29.45	1.59	< 0.001*	(1.25 -2.04)

**Table 4 Psychosocial, health and demographic characteristics of participants who report serious teenager problems: multivariate logistic regression model (Continued)**

Efficacy	Yes	1,027	20.22	1.00		
	No	305	32.87	1.28	0.064	(0.99 -1.67)
Neighbourhood belonging	Yes	975	19.98	1.00		
	No	357	31.65	1.30	0.074	(0.97 -1.73)
Self-esteem from neighbourhood	Yes	950	18.89	1.00		
	No	382	38.98	1.66	< 0.001*	(1.39 -1.99)
Neighbourhood decline in last 2 years	No decline	878	19.24	1.00		
	Declined	351	41.20	2.53	< 0.001*	(1.92 -3.32)
<b>Social networks and connections with neighbourhood</b>						
Meet with relatives	≥ weekly	379	18.18	1.00		
	< weekly	953	24.29	1.56	< 0.001*	(1.23 -1.98)
Meet with friends	≥ weekly	282	18.44	1.00		
	< weekly	1,050	23.44	1.05	0.725	(0.80 -1.38)
Social support	Someone	907	19.21	1.00		
	Nobody	425	33.02	1.77	< 0.001*	(1.36 -2.29)
Contact with neighbours	< weekly	282	19.65	1.00		
	≥ weekly	1,050	22.96	1.37	0.007	(1.09 -1.73)
Length of residence in neighbourhood (years)	< 2	202	20.76	1.00		
	≥ 2	1,072	22.05	1.23	0.238	(0.87 -1.73)
Walk around neighbourhood	< weekly	196	17.58	1.00		
	≥ weekly	1,132	23.38	1.63	0.011	(1.12 -2.37)

<sup>1</sup> Number of participants from each category who report teenagers are a serious neighbourhood problem (categorical data only)

<sup>2</sup> Percentage of participants from each category who report teenagers are a serious neighbourhood problem categorical data only)

<sup>3</sup> Odds ratio

<sup>4</sup> P value

<sup>5</sup> 95% Confidence interval

\*  $P < 0.05$  after Bonferroni correction

Total sample  $n = 6008$ ; number of observations = 5584

from deprived areas, and that those riots did not spread to Glasgow [18]. However, the study and its findings are clearly relevant to an issue that has both a longstanding and current place at the forefront of political and public debates. The current study contributes to existing knowledge by focusing on perceptions of young people's ASB in disadvantaged areas, and by using a validated measure of physical and mental health (SF-12v2) for its primary outcome. In contrast, previous studies have usually focused on measures of ASB that are not age-specific. The small number that do focus on young people's ASB tend to either compare deprived areas with more affluent areas (useful for identifying social inequalities in PASB but less useful for exploring variation within deprived populations), and/or do not use a validated health questionnaire.

However, we note that our independent variables were based on self-reported measures, as was the dependent variable: raising the possibility of bias from common method variance[55]. The 50% response rate is, we think, reasonable for a study of very disadvantaged neighbourhoods but raises the possibility of response bias. We also stress that cross-sectional data is useful for identifying associations but other types of study design are required

to establish causal pathways between associations. This was a relatively well powered study: whilst this should be seen as a strength, it does mean the study is capable of detecting a range of associations including associations that are potentially too small to be of public health significance. Finally, the Bonferroni correction reduces the risk of type 1 errors, but has been criticised for doing so at the expense of increasing the likelihood of type 2 errors [53].

Crucially, our survey did not give participants the chance to say whether they thought that ASB problems were perpetrated by a minority or majority of local teenagers, nor did it consider the perceptions of residents who were less than 16 years old.

## Conclusions

In addressing its primary research questions, this study has found small, but statistically significant, associations between perceptions of young people's ASB and residents' physical health (but not mental health) in disadvantaged areas. Given the small effect size, we caution against assuming that there are substantial health gains to be achieved out of tackling concerns about teenagers' ASB in deprived communities.

Although the findings do not present a compelling case for making PASB a public health priority, it is still important to address concerns about young people's ASB. Reasons for doing so may include improving social cohesion, reducing fear and isolation, and improving the general quality of people's lives - particularly in neighbourhoods burdened by multiple disadvantages. Policy-makers and researchers have advocated strategies to reduce PASB that include improving "the social dynamics of neighbourhoods" [2,3]. Exploring cross-sectional associations is one way of informing such strategies - by identifying the population sub-groups most concerned by young people's behaviour, and the social/psychosocial characteristics that can help explain why PASB varies within communities.

Our psychosocial findings indicate that people who do not feel good about their neighbourhood in a variety of ways, and who have more contact with their neighbours in such circumstances, are much more likely to identify youth ASB. Hence policy and practice efforts could explore means of creating a 'feel good' factor within local areas, so that neighbourly contacts might be less likely to focus on negative experiences and observations of the area; this may involve using communication efforts alongside environmental improvements. Second, there is a case for trying to identify relatively isolated individuals (who are more likely to identify youth ASB) within disadvantaged areas, and put in place networking mechanisms to enhance support relations between residents. However, our findings also suggest a need to be cautious about assuming that improving connectivity between neighbours or tackling inter-generational prejudice within neighbourhoods offer simple solutions to PASB. Attempts to tackle PASB should be evaluated to measure feasibility and effectiveness.

Finally, we suggest that researchers and policy-makers engage more with older members of deprived communities in order to explain why elderly residents appear to be less troubled than their younger neighbours by teenagers and ASB. Dialogue with this group, which includes those residents who have had the longest experience of living with disadvantage, may help us learn more about their coping strategies, attitudes and resilience.

## Additional material

Additional file 1: Variables used in PASB analysis.

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## Authors' contributions

All the authors have contributed to this study's design and methods. ME led the analysis and writing of this manuscript. All the other authors have been involved in revising it critically for important intellectual content and have approved the final version.

## Competing interests

GoWell is a collaborative partnership between the Glasgow Centre for Population Health, the University of Glasgow, and the MRC/CSO Social and Public Health Sciences Unit. The programme's main sponsors are Glasgow Housing Association, the Scottish Government, NHS Health Scotland and NHS Greater Glasgow and Clyde. Some of the sponsors (e.g. Glasgow Housing Association and the Scottish Government) are also delivering interventions being evaluated by GoWell. Such sponsors are represented on GoWell's steering group and can suggest specific research topics and comment on non-academic dissemination of findings. GoWell's research team does not include anyone from the organisations delivering interventions being evaluated, nor has anyone from those organisations contributed to or commented upon this manuscript.

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