Journal of Public Health | Vol. 34, No. S1, pp. i48–i56 | doi:10.1093/pubmed/fds001

Adolescent multiple risk behaviour: an asset approach to the role of family, school and community

F.M. Brooks[1], J. Magnusson[1], N. Spencer[2], A. Morgan[3]

[1]Adolescent and Child Health Research Group, CRIPACC, University of Hertfordshire, College Lane Campus, Hatfield, Hertfordshire AL10 9AB, UK
[2]Statistical Services and Consultancy Unit, Business School, University of Hertfordshire, de Havilland Campus, Hatfield, Hertfordshire AL10 9AB, UK
[3]CRIPACC, University of Hertfordshire, College Lane Campus, Hatfield, Hertfordshire AL10 9AB, UK
Address correspondence to Fiona Brooks, E-mail: f.m.brooks@herts.ac.uk

ABSTRACT

Background Engagement in risk behaviours may pose a significant threat to health if involvement spans multiple behaviours. The asset model suggests that contextual aspects of young people's lives, such as factors related to family, school and community, serve as a protective function against health risk behaviours.

Methods A risk-taking index was created from the English health behaviour in school-aged children study on 15 years olds, substance use and sexual activity. Using a multinomial regression, potential asset variables relating to school, family, peers, community and family affluence were tested for their association with levels of risk behaviours.

Results Sense of neighbourhood belonging, strong school belonging and parental involvement in decision-making about leisure time were related to lower engagement in health risk behaviours. A weaker sense of family belonging was associated with increased risk behaviours if connectedness with teachers was also low. Factors related to school and community played a greater role in adolescent participation in health-related risk behaviours than family-related factors, including family affluence.

Conclusions Feelings of safety and belonging in the out-of-home settings of adolescents were positively associated with reduced risk behaviours, and indicate the importance of the wider community alongside parents and school as protective assets for health.

Keywords adolescence, health assets, risk behaviours, social capital

Introduction

Engagement in behaviours deemed as 'risky' such as involvement with alcohol, tobacco and other substance use is relatively common by the time young people reach 15 years of age. Recent data show that in England ~40% of young people at this age have tried smoking tobacco, 25% have tried cannabis, 63% have drunk some alcohol in the last 30 days with ~40% reporting more than two episodes of drunkenness and 27% of boys and 32% of girls have had sexual intercourse.[1] Some experimentation is a normative feature of adolescence and may even indicate a greater psychological adjustment than complete abstention,[2] and frequent and/or multiple involvement in several types of risk behaviour may pose a more significant threat to health and well-being,[3] as well as being associated with sustained involvement in risk behaviour into adulthood.[4]

Health promotion interventions aimed at young people in recent decades have predominantly focused on reducing specific health risk behaviours or set of compartmentalized 'fixable faults' such as teenage pregnancy or substance misuse.[5,6] The overarching focus on separate behaviours has tended to preclude consideration being given to the interrelationship between health risk behaviours and the contextual factors that may either increase risk or operate as protective factors. In particular, there has been little consideration of the resources or assets that might promote

F.M. Brooks, Professor of Health Services Research
J. Magnusson, Research Fellow
N. Spencer, Principal Lecturer in Statistics
A. Morgan, Honorary Research Fellow

young people's well-being, including contributory attributes such as resilience, self-esteem and self-efficacy. Consequently, there has been a call to public health to move away from single issue approaches and instead develop public health and health promotion actions that focus on common protective factors.[7] Increasingly, asset based approaches to health and development are being seen, particularly in relation to young people's health and well-being, as offering the potential to unlock some of the existing barriers to effective action on health inequities, so far characterized more by deficit approaches.[8]

Health assets have been subject to a number of different interpretations and are contested in terms of the relationship between individual psychological dimensions and external factors.[9] For the purposes of this paper, health assets are defined as any resource that can ameliorate the effects of exposure to risk in a positive direction but can also operate in an additive protective way that still enables positive adaptations independent of risk exposure.[8,10]

The Search Institute (www.searchinstitute.org) has identified 40 developmental assets essential for healthy youth development including family dynamics and relationships, support from adults in their community and school, school effectiveness, peer influence, values development and a range of specific skills and competencies required for young people to thrive.

An understanding of how to develop assets based on, as opposed to, a deficit approach to young people's health is relatively underdeveloped in the UK. Work in relation to health assets is currently seeking to address key questions that are highly salient for the development of assets-based public health actions. Most notably, are some assets more critical in terms of influencing risk-taking behaviour than others? How far do identified assets demonstrate stability across different social and cultural contexts? One way to begin constructing a more refined asset model and address notions relating to the relative importance of some assets over others is by considering the assets that may be available or absent for those young people who engage in a cluster of risky behaviours, and at a relatively high frequency. One of the criticisms of a health asset approach is that it is significantly weakened by consideration of the influence of socio-economic status and inequalities.[11] However, a distinguishing feature of those who engage in multiple risk behaviours is an absence of a straightforward correlation with material disadvantage.[12] Rather, there are patterns of behaviour which are intertwined in the complex array of contexts in which the adolescent is embedded, of which family and school represent the most systematically researched.[12]

One way of providing a framework for conceptualizing the *contextual assets* of the young person that is also amenable to public health policy and interventions is through the concept of social capital. Models of social capital recognize that health-related behaviours are shaped and constrained by a range of social and community contexts and the ways in which an individual relates to social networks and communities has important effects on their health and well-being.[13–15] Social capital acts as a potential resource for society contributing to a range of economic, social and health benefits and can therefore be considered to be an example of a health asset.[16] Social capital then offers a framework for exploring the importance the specific range of protective factors that are located within the social context or environment of the young person and operate as a protective factor of young people's health. Morgan[16] also observed that individual constructs of social capital mirror many of the assets already identified by the Search Institute. This framework also facilitates an easier translation of research findings into policy and practice.

This paper draws on data from the World Health Organization international health behaviour in school-aged children (HBSC) study which investigates a range of social determinants on youth health.[18] Findings from the most recent HBSC study for England[1] are presented to provide an examination of key assets that are protective of multiple and high-frequency risk behaviours across a range of contexts.

The aim of this paper is to contribute to assets-based research by exploring whether and how key dimensions of social capital may be operating as influential assets in relation to multiple risk behaviour among young people. Morrow's[17] work is employed to frame a set of indicators of social capital developed by the HBSC study network.[18] Four domains were developed: sense of belonging, autonomy, social networking and social support.

The measurement of risk behaviour in young people is frequently constructed in the form of an index of behaviours linked to substance use, sexual behaviour and other risky practices such as driving (or being in a car) without a seatbelt.[19,20] Studies vary on how such indices are calculated, and what level of frequency is considered 'risky'. For the purpose of this study, it was recognized that a certain amount of participation in risk behaviours is common among young people of this age, and that infrequent 'experimentation' is unlikely to cause severe consequences for health and well-being.[2] Rather, the aim was to focus attention on factors or health assets that might operate to protect and mitigate against involvement in a clustering of 'high'

health risk behaviours, such as frequent and multiple substance use and unprotected sexual intercourse.

Specifically the paper aims to:

(1) identify the relative importance of risk and protective factors for involvement in low-, medium- and high-risk behaviour,
(2) identify which assets are associated with protection against young people's involvement in risky behaviour in a UK context.

Methods

Participants and procedure

A total of 1255 students (46% boys) aged 15 years who completed the HBSC survey in 2009/10 were included in the analysis. A random sample of all secondary schools in England was drawn (state and independent schools), stratified by region, size and type of school to ensure representative participation. The original sample consisted of 120 schools; in addition to this booster samples were drawn for schools that have a high proportion of students from ethnic minority backgrounds (50 schools) or who receive free school meals (60 schools). Sampling was done by replacement, so that if/ when one school from the original sample refused to participate, a matched school from a second list was contacted instead. If this school also refused, a second matched school was contacted. Following this procedure, 30 schools (a total of 196 classes) were recruited. All sampled schools were contacted by letter, follow-up letter and by personal phone call. Final recruited schools were broadly representative in terms of geographical spread, size and type of school. A somewhat higher proportion of students in our sample were from ethnic minority backgrounds compared with the population from which they were drawn; data were therefore weighted for ethnicity to bring it in line with census data for children of comparable age. Questionnaires were distributed to young people during regular classroom time by researchers or teachers; background and purpose of the study was explained and participants were reassured that their participation was confidential and voluntary. The questionnaire took between 45 and 60 min to complete (one standard school lesson), the layout of the questionnaire was developed in conjunction with a young people's reference group and avoids skip patterns in the questions. Taking into account parent/student non-consent to participate, illness and absence for other reasons, student response rate was just over 90%. It is unknown whether those students who did not take part differed in any significant way from those who did, however due to their small numbers any impact of such differences are considered to be minimal. For full details of data collection method and survey, see Brooks *et al.*[1]

Ethics and consent

The study gained ethics approval via the University Ethics Committee for Health and Human Sciences (NMSCC/07/09/19/A). Once permission was gained from schools, information letters were sent to all pupils in participating classes explaining the study and asking pupils to complete and return (to their school) an opt-out form if they did not wish to participate. In accordance with the specifications of the ethics committee, the same information was also provided for parents in a letter taken home by the young person. Parents who were asked to complete a form of non-consent if they did not wish their child to take part in the study.

Risk behaviour index

A risk behaviour index was created based on engagement in five behaviours relating to substance use and sexual activity (Table 1). The behaviours (drinking alcohol and frequency of drunkenness, smoking cigarettes, cannabis use and sexual behaviour) were chosen because of their widespread application in research modelling multiple risk behaviour in

Table 1 Items included in the risk behaviour index

	Score 0	*Score 1*	*Score 2*
Have you ever had so much alcohol that you were really drunk?	No (50.2%)	Yes, once (13.0%)	More than once (36.8%)
On how many occasions (if any) have you drunk alcohol in the last 30 days?	None (44.6%)	One or two (22.6%)	More than two (32.9%)
On how many occasions (if any) have you smoked cigarettes in the last 30 days?	None (78.4%)	One or two (6.8%)	More than two (14.8%)
On how many occasions (if any) have you taken cannabis (sometimes called pot, dope or weed) in the last 12 months?	None (82.3%)	One or two (7.4%)	More than two (10.3%)
The last time you had sexual intercourse, did you or your partner use a condom?	Have never had sexual intercourse (73.0%)	Yes (19.4%)	No (7.7%)

adolescence and therefore could be taken to represent the key health risk behaviours of relevance to adolescence.[3,20] No engagement in a particular behaviour scored 0, minimal/experimental engagement scored 1 and more frequent/heavy engagement scored 2. The scores were added together; a total score of 0 was taken to indicate *no risk* (31.9% of cases), a total score between 1 and 5 inclusive was taken to indicate *some risk* (50.2% of cases) and total scores of 6 and above were taken to indicate *high risk* (17.8% of cases).

Asset variables

Four categories of assets were investigated: (i) sense of belonging [associated with family (FSB),[21] school (SSB) and neighbourhood (NSB)];[22,23] (ii) autonomy [personal autonomy in relation to family (PAF) and peers (PAP), and student autonomy in relation to school (SAS)]; (iii) social networking [associated with neighbourhood (NSN)]; (iv) social support [associated with family communication with father (FCF), family communication with mother (FCM), teachers (TSS) and peers (PSS)]. Additionally, gender and a measure of family affluence (FAS) were considered for inclusion in the model.

The asset categories were calculated to provide groupings of low, medium or high values for each category (Table 2), except for two variables:

(i) *FCM and FCF* was created based on young people's reports of how easy or difficult they found talking to various people about things that really bothered them. Two family social support variables were created from responses to answers relating to father/step father and mother/step mother. The two independent variables (one for female relative and one for male relative) were derived from responses to the following options: 'very

Table 2 Asset variables

	Response categories	*Score low*	*Score medium*	*Score high*
FSB: eight items: 'How often do you (e.g. watch TV, eat a meal, go for a walk) with your family?'	'Every day' (5) to 'never' (1)	8–16	17–24	25–40
SSB: three items: 'Students at school like being together; I feel like I belong in this school; I feel safe in this school'	'Strongly agree' (5) to 'strongly disagree' (1)	3–6	7–11	12–15
NSB: seven items, e.g. 'There are good places to spend your free time (e.g.: leisure centres, parks, shops); I could ask for help or a favour from neighbours; I feel safe in the area'	'Strongly agree' (5) to 'strongly disagree' (1)	7–14	15–27	28–35
PAF: one item: 'How much say do you have when you and your parents are deciding how you should spend your free time outside of school?'		'My parents usually decide' and 'My parents and I decide, but I usually do what they want me to do'	'My parents and I decide, but I usually can do what I want'	'I usually decide how I spend my free time outside of school'
PAP: one item: 'How do you and your group of friends decide what to do together?'		'One of my friends usually decides' AND 'My friends and I decide but I usually do what my friends want'	'My friends and I decide what to do together'	'I usually decide what we will do'
SAS: five items; e.g. 'Students get to participate in deciding class rules; students ideas are treated fairly'	'Strongly agree' (5) to 'strongly disagree' (1)	5–10	11–19	20–25
TSS: three items: 'When I need extra help I can get it; My teachers are interested in me as a person; Most of my teachers are friendly.'	'Strongly agree' (5) to 'strongly disagree' (1)	3–6	7–11	12–15
PSS: three items: 'How easy is it to talk to (1) best friend; (2) friends of same sex; (3) friends of opposite sex?'	'Very easy' (4) to 'very difficult' (1)	3–5	6–9	10–12

easy' (coded as 4); 'easy' (3); 'difficult' (2) and 'very difficult' (1). Responses to categories were collapsed into a binary variable for FCM and FCF: difficult/easy.

(ii) *NSN* was derived from responses to questions regarding types of organized activities engaged in during leisure time (eight items), e.g. sport; music and drama; political organizations and voluntary activity. Scores were given to the responses to each item as: 'don't do this activity' (1); '2–3 times a month or more seldom' (2); 'about once a week' (3) and '2 times a week or more' (4). The independent variable was formed by the sums of score across potential activities into no NSM (7); low NSN (8–14); medium NSN (15–21) and high NSN (22–28).

In addition to the asset variables described, gender and family affluence were also included as independent variables. Family affluence was determined through using the standard HBSC FAS which generates scores of low, medium or high family affluence.[24]

Data analysis

The data analysis examined the relationship between the three-category risk behaviour index and the asset variables described above along with gender and family affluence.

As the HBSC survey is conducted by giving questionnaires to students grouped in classes within schools, it is appropriate for multilevel modelling methods to be considered for use. An investigation using the package MLwiN (version 2.23) revealed that although the variation between schools was significant, it only accounted for a small proportion of the overall variation (<10%). It also revealed that taking the multilevel structure into account only lead to slight variations in the standard errors associated with the parameter estimates in the model when compared with a single level model. Thus, the results obtained using a standard ordered multinomial regression did not differ greatly from those obtained from a multilevel analysis.

The analysis was undertaken using SPSS Statistics version 17.0. A backward elimination procedure was applied, starting with all the above variables in the model and sequentially removing the least significant variable until all include a term with $P < 0.05$. All two-way interactions between the remaining variables were then added to the model and again a backward elimination procedure was used to sequentially remove interactions that did not reach significance at the 5% level. The model fitting process was completed with six main effects and two two-way interactions.

Results

Risk behaviour index

A total of 1087 students provided information on all the risk behaviour variables and thus had a risk behaviour index calculated. Other than them having completed all the questions relating to the relevant variables, the students who were included in this analysis did not differ markedly from those who were not. Thirty-two percent of students fell into the 'no risk' category; 50% were classified as 'some risk' (score 1–5) and 18% were classified as 'high risk' (score 6–10).

Multinomial regression

The effects that were contained in the final model were as follows (see also Table 3).

Personal autonomy in relation to family

Those with low PAF had a lower associated risk than those with high PAF (odds ratio (OR) = 0.368, $P < 0.001$). Those with low PAF had a lower associated risk than those with medium PAF (OR = 0.575, $P = 0.016$). Those with medium PAF had a lower associated risk than those with high PAF (OR = 0.640, $P = 0.002$).

School sense of belonging

Those with high SSB had a lower associated risk than those with medium SSB (OR = 0.741, $P = 0.029$). Although those with high SSB are not shown to have a significantly lower associated risk than those with low SSB, this is likely to be because the small number of cases with low SSB results in insufficient evidence to make such a claim rather than because no such effect exists.

Table 3 Odds ratios for main effects not involved in interactions (95% confidence intervals in brackets)

	Low versus medium as reference	*Low versus high as reference*	*Medium versus high as reference*
PAF	OR = 0.575 (0.363, 0.912), $P = 0.016$	OR = 0.368 (0.237, 0.572), $P < 0.001$	OR = 0.640 (0.482, 0.850), $P = 0.002$
	High versus medium as reference	*High versus low as reference*	*Medium versus low as reference*
SSB	OR = 0.741 (0.563, 0.975), $P = 0.029$	OR = 1.007 (0.507, 1.997), $P = 0.985$	OR = 1.359 (0.379, 1.428), $P = 0.355$
NSB	OR = 1.110 (0.820, 1.503), $P = 0.492$	OR = 0.401 (0.193, 0.832), $P = 0.012$	OR = 0.361 (0.180, 0.724), $P = 0.003$

Neighbourhood sense of belonging

Those with medium (OR = 0.361, $P = 0.003$) or high (OR = 401, $P = 0.012$) NSB had a lower associated risk than those with low NSB.

FSB, TSS and gender

Each of these variables was represented in the final model by a main effect but there were also two interactions involving these variables: FSB with TSS and TSS with gender. Boys and girls had the same risk when TSS was low or high. However, when TSS was medium, boys had a lower risk than girls (OR = 0.602, P for interaction = 0.015). High levels of TSS were associated with less risk than medium TSS (OR = 0.457, $P = 0.003$). Low levels of TSS were associated with increased risk when FSB was low (OR = 16.097 compared with medium TSS and OR = 27.452 compared with high TSS, P for interaction = 0.002).

Associations between the risk index and student autonomy relating to school (SAS), PSS, PAP, FCM/FCF, NSN and FAS were not found to be significant.

Patterns across the risk index

Personal autonomy in relation to family

Although the results from the modelling showed that those with low PAF had a lower associated risk overall than those with medium or high PAF (44% of low PAF were classified as 'no risk' compared with 28% of medium PAF and 18% of high PAF), they were no less likely to be classified as 'high risk' (Table 4).

Table 4 Patterns across the risk index for PAF, SSB and NSB

	No risk (%): score 0	*Some risk (%): score 1–5*	*High risk (%): score 6–10*
PAF			
Low	44	37	19
Medium	28	56	16
High	18	58	24
SSB			
Low	17	58	25
Medium	21	54	25
High	29	56	15
NSB			
Low	14	43	43
Medium	25	54	21
High	26	58	17

School sense of belonging

A greater proportion of young people in the high SSB group were classified as 'no risk' (and a lower proportion as 'high risk') than those in the medium SSB group; the groups did not however differ in the proportions falling into the 'some risk' category (Table 4).

Neighbourhood sense of belonging

Among those with low NSB, equal proportions were classified as 'some' and 'high' risk, whereas the medium and high NSB groups had a majority of members classified as 'some risk' (Table 4).

FSB interaction with TSS

Those young people who scored low on both the FSB and TSS had a dramatically higher proportion of members falling into the 'high-risk' group than other respondents (Table 5).

Discussion

Main findings of this study

Core domains of social capital were found to operate as protective assets for young people in relation to multiple health risk behaviours, both in terms of frequency and clustering of high-risk behaviours. Assets associated with a lower risk included levels of autonomy within the family, SSB, and a positive sense of community cohesion and belonging. Further, it appears that low teacher connectedness (measured here as TSS) becomes a significant risk factor when FSB is also low. Overall, the findings highlight the significance for young people of having access to some form of adult support for the prevention of multiple risk behaviours. No relationship was found between involvement in multiple substance use over the last 30 days and family affluence.

Table 5 Patterns across the risk index for interaction between FSB and TSS

FSB	*TSS*	*No risk (%): score 0*	*Some risk (%): score 1–5*	*High risk (%): score 6–10*
Low	Low	7	9	84
	Medium	18	53	29
	High	25	56	20
Medium	Low	17	51	32
	Medium	20	55	26
	High	25	60	15
High	Low	26	74	0
	Medium	23	59	17
	High	37	53	10

What is already known about the topic

Existing work has demonstrated that social capital matters for young people's health and well-being,[22,23,25,26] and that contextual dimensions of social capital can operate as protective assets in this area.[8] However, less is known about how and even which assets may operate in the context of co-occurrence of several different risk behaviours.[27]

Parental conventionality and a strong bond between the adolescent and child have been demonstrated consistently to operate as a preventive mechanism against exposure to risk,[28] while a supportive relationship and family belonging have been demonstrated as a protective asset for health and well-being.[26,29]

Teacher connectedness, as a feature of overall school connectedness has, especially in the USA, been associated with reduced engagement with health risk behaviours.[12,30] However, the potential protective link between student and teacher relationships in terms of engagement in multiple health behaviours has been less well examined in the UK.

Neighbourhood and community have been previously investigated as potential factors associated with substance use and risk behaviour in adolescents in a number of studies[31] although, again, less is known about the relationship with multiple risk behaviours.[27] Community disorganization has been found to be a risk factor for involvement in substance use among adolescents,[32] while others have concluded that a strong sense of community cohesion, and especially trust and support between community members, is a protective factor, or asset, against involvement in multiple health risk behaviours.[23,33] Morrow[17,34] found that small scale inter-personal networks were crucial to a sense of belonging while membership of more formal community networks and associations appeared to have a very limited impact on a sense of well-being. This study explored the informal more interpersonal aspects of neighbourhood cohesion, such as feelings of safety, access to good public and community spaces and community support.

What this study adds

The findings offer a perspective from UK adolescents as to how contextual domains of social capital operate as potential protective assets in the context of the multiple risk behaviours.

The findings add to the understanding of how and when aspects of parenting can operate as protective assets for young people. Consequently, the findings presented here add to work that has identified how family belonging contributes to well-being by illustrating how parental regulation of adolescent autonomy and negotiation over leisure operates as a protective mechanism against multiple and high-frequency risk behaviours.

However, factors related to school and community played a greater role in adolescent engagement in multiple health risk behaviours than family-related factors, although family affluence was not found to be a significant predictor. The fact that family affluence was not retained in the model adds weight to the need to understand health-related risk taking in adolescence as determined by a broad range of contextual factors. These findings indicate the importance of adults other than parents as protective assets for the health and well-being of young people, especially in relation to the significance of having a personal connection to a teacher in instances when parental connectivity may be low.

This paper provides evidence for the significance of growing up in a community with strong cohesion in which adolescents feel a positive sense of belonging to that community. Achieving independence is a normative developmental task, thus adolescence is likely to be a time when young people are experiencing public spaces without parental supervision. This study, by looking at neighbourhood in terms of the experience of young people, has considered how informal aspects of the local environment have significance for young people. Young people's feelings of safety in out-of-home settings, having a place in their community and perceiving the wider adult community as supportive, appears to have an important protective function in preventing the most harmful forms of health-related risk behaviours.

Limitations

As is the case generally with cross-sectional studies, causality relating to assets and health-related risk behaviours cannot be ascertained from this study. Certain variables were associated with more or less engagement in health-related risk behaviours in this sample, but it cannot be concluded that an increasing assets among particular groups will necessarily lead to less risk behaviours. Further, as there are no generally agreed cut-offs of what constitutes 'acceptable' versus 'high' risk, the comparison of the groups within the index is usefully considered to be exploratory at this stage. The construction of what constitutes high vs. low personal autonomy may also be debated. To construe adolescent autonomy as low if decisions regarding how to spend free time is undertaken together with parents but usually result in the adolescent complying with the wish of parents, is justified if representing the young person 'giving in' to the requests of adults. However, it is also possible that decisions made in this way simply represent high general agreement between the adolescent and their parents regarding how to spend free time.

The low proportion of students falling into the low SSB category could potentially explain why this variable showed only limited associations. Since those young people who were absent from school on the day of the survey might potentially be those with the lowest SSB, different associations may have occurred had they also been included. More generally, students absent from school may have different characteristics from those who are not and this could have influenced the outcomes.

Conclusions

The asset approach has emerged as one way in which policy-makers, researchers and practitioners can think differently about maximizing opportunities for the health and well-being of young people.[16] The contextual domains of social capital that are highlighted in this paper as operating as protective assets illustrate the potential need for the development of multilevel public health actions to address multiple risk behaviours among young people.

The potential of teacher connectedness to operate as a protective asset, especially in the absence of family belonging indicates that within the education system considerable health benefit may be achieved by improving student–teacher relationships.

Most notably, assets that are protective and mitigate against multiple and high frequency health risk behaviours for young people extend beyond those adults (i.e. teachers and parents) with direct responsibility for young people and can be linked with the actions of adults in the local community. The positive associations between reduced risk taking and with feelings of safety and belonging in the out-of-home settings of adolescents warrant policy and practice level attention. Consideration of how to create community and neighbourhood resources for young people could be one aspect of public health and health promotion strategies that as yet are underdeveloped, but may offer a way to further extend young people's access to assets that are protective of their health.

Acknowledgements

The team owe a debt of gratitude to all the schools, teachers and especially the young people who participated in this study. We are extremely grateful for the time and help they gave to this project.

Funding

This work was supported by the Department of Health and the Department for Education.

References

1 Brooks F, Magnusson J, Klemera E *et al*. *Health Behaviour in School-aged Children (HBSC)*. England National Report 2010. Hatfield: University of Hertfordshire, 2011.

2 Shedler J, Block J. Adolescent drug use and psychological health: a longitudinal inquiry. *Am Psychol* 1990;**45(5)**:612–30.

3 Donovan JE, Jessor R, Costa FM. Syndrome of problem behavior in adolescence: a replication. *J Consult Clin Psychol* 1988;**56(5)**:762–5.

4 Cable N, Sacker A. Typologies of alcohol consumption in adolescence: predictors and adult outcomes. *Alcohol Alcohol* 2008;**43(1)**:81–90.

5 Scales PC. Reducing risks and building developmental assets: essential actions for promoting adolescent health. *J School Health* 1999;**69(3)**:113–9.

6 DCSF. Aiming high for young people: a ten year strategy for positive activities. HM Treasury: *Department for Children Safety*, 2007.

7 Viner RM, Barker M. Young people's health: the need for action. *BMJ* 2005;**330(7496)**:901–3.

8 Morgan A, Ziglio E. Revitalising the public health evidence base: an asset model. In: Morgan AD, M. Ziglio E. (eds). *Health Assets in a Global Context: Theory, Methods, Action*. New York: Springer, 2010.

9 Fergus S, Zimmerman MA. Adolescent resilience: a framework for understanding healthy development in the face of risk. *Ann Rev Public Health* 2005;**26(1)**:399–419.

10 Olsson CA, Bond L, Burns JM *et al*. Adolescent resilience: a concept analysis. *J Adolesc* 2003;**26(1)**:1–11.

11 Mohan J, Twigg L, Barnard S *et al*. Social capital, geography and health: a small-area analysis for England. *Soc Sci Med* 2005;**60(6)**:1267–83.

12 Resnick MD, Bearman PS, Blum RW *et al*. Protecting adolescents from harm. *JAMA* 1997;**278(10)**:823–32.

13 Hawe P, Shiell A. Social capital and health promotion: a review. *Soc Sci Med* 2000;**51(6)**:871–85.

14 Gillies P. Effectiveness of alliances and partnerships for health promotion. *Health Promot Int* 1998;**13(2)**:99–120.

15 Baum F. Social capital, economic capital and power: further issues for a public health agenda. *J Epidemiol Community Health* 2000;**54(6)**:409–10.

16 Morgan A. Social capital as a health asset for young people's health and wellbeing. *J Child Adolesc Psychol Suppl* 2010;**2**:19–42.

17 Morrow V. Conceptualising social capital in relation to the well-being of children and young people: a critical review. *Sociol Rev* 1999;**47(4)**:744–65.

18 Currie C. *Health Behaviour in School-aged Children: Research Protocol for the 2001–2 Study*. Edinburgh: RUHBC, 2002.

19 Denny SJ, Robinson EM, Utter J *et al*. Do schools influence student risk-taking behaviors and emotional health symptoms? *J Adolesc Health* 2011;**48(3)**:259–67.

20 Madkour A, Farhat T, Halpern C *et al*. Early adolescent sexual initiation and physical/psychological symptoms: a comparative analysis of five nations. *J Youth Adolesc* 2010;**39(10)**:1211–25.

21 Zaborskis A, Zemaitiene N, Borup IEK *et al*. Family joint activities in a cross-national perspective. *BMC Public Health* 2007;**94(7)**:1–14.

22 Kawachi I, Kennedy BP, Lochner K *et al*. Social capital, income inequality, and mortality. *Am J Public Health* 1997;**87(9)**:1491–8.

23 Boyce WF, Davies D, Gallupe O *et al*. Adolescent risk taking, neighborhood social capital, and health. *J Adolesc Health* 2008;**43(3)**:246–52.

24 Roberts C, Freeman J, Samdal O *et al*. The health behaviour in school-aged children (HBSC) study: methodological developments and current tensions. *Int J Public Health* 2009;**54(0)**:140–50.

25 McCulloch A. Social environments and health: cross sectional national survey. *BMJ* 2001;**323(7306)**:208–9.

26 Morgan A, Haglund BJA. Social capital does matter for adolescent health: evidence from the English HBSC study. *Health Promot Int* 2009;**24(4)**:363–72.

27 Pickett W, Garner MJ, Boyce WF *et al*. Gradients in risk for youth injury associated with multiple-risk behaviours: a study of 11,329 Canadian adolescents. *Soc Sci Med* 2002;**55(6)**:1055–68.

28 Hawkins JD, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychol Bull* 1992;**112(1)**:64–105.

29 Fenton C, Brooks F, Spencer NH *et al*. Sustaining a positive body image in adolescence: an assets-based analysis. *Health Soc Care Community* 2010;**18(2)**:189–98.

30 McNeely C, Falci C. School connectedness and the transition into and out of health-risk behavior among adolescents: a comparison of social belonging and teacher support. *J Sch Health* 2004;**74(7)**:284–92.

31 Youngblade LM, Curry LA, Novak M *et al*. The impact of community risks and resources on adolescent risky behavior and health care expenditures. *J Adolesc Health* 2006;**38(5)**:486–94.

32 Hays SP, Hays CE, Mulhall PF. Community risk and protective factors and adolescent substance use. *J Prim Prev* 2003;**24(2)**:125–42.

33 Cleveland M, Feinberg ME, Bontempo DE *et al*. The role of risk and protective factors in substance use across adolescence. *J Adolesc Health* 2008;**43(2)**:157–64.

34 Morrow V. 'No ball games': children's views of their urban environments. *J Epidemiol Community Health* 2003;**57(4)**:234.