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School effects on health behaviours

This paper reports on variation in levels of teenage substance use between eight secondary schools in the West of Scotland. After adjusting for differences in the pupils attending the schools, substantial between-school variation ('school effects') remained for smoking, and to a lesser degree, drinking. An in-depth study of three of the schools suggested that between-school differences in smoking were associated with differences in specific health education and promotion activities, as well as with more general aspects of relationships and communication both within the schools and with parents and professionals from the local community.

It has been recognised for some time that health-damaging behaviours account for a large component of morbidity and mortality in developed countries (Henderson, Hutcheson, & Davies, 1996; World Health Organisation, 1986). If schools can make a positive impact on pupils' health behaviour, at a stage when lifestyles are still being formed, this would make a contribution to the future well-being of the individual, the economy and society as a whole. Health behaviours that are formed during the secondary school years include smoking, drinking and drug use, three outcomes that are the focus of this paper.

Smoking

Smoking is the biggest single cause of preventable death in the UK, killing more than 120,000 people each year, and the UK Chief Medical Officer's number one "tip for better health" is "Don't smoke and don't breathe others' tobacco smoke"(Choosing Health, 2004; Shibuya, Ciecierski, Guindon, Bettcher, Evans, & Murray, 2003). The UK government aims to reduce the number of 11-15 year olds who smoke from 13% in 1996 to 9% in 2010 (Department for Education and Employment, 1999), and there are good reasons for prioritising a reduction of young people's smoking. Most smokers begin smoking in adolescence, and decreases in adult smoking since the 1970s have not been accompanied by equivalent decreases in adolescent smoking (ASH, 2003; Townsend, Wilkes, Haines, & Jarvis, 1991). Adolescence is a critical period in the establishment of smoking habits for most smokers. Moreover, the earlier smoking begins, the harder it is to give up later (Coambs, Seline, & Kozlowski, 1992).

Alcohol

While moderate alcohol consumption is not of major public health concern for adults and may even be beneficial, heavy or 'binge' drinking can lead to physical and psychological problems such as cirrhosis, high blood pressure, amnesic syndrome, drink related accidents, social and family problems, crime and violence. It has been estimated that the total annual societal costs of alcohol misuse in Scotland at 2001/02 prices is £1071 million (Catalyst Health Economics Consultants Ltd., 2001). There is growing concern over heavy drinking and 'binge' drinking among adolescents, reported mainly in school-based surveys (Forsyth & Bernard, 2000; West & Sweeting, 2002). Drinking and intoxication are now perceived as normal among adolescents (MacAskill, Cooke, Eadie, & Hastings, 2001).

Drugs

Illicit drugs may impact directly on health. The Registrar General for Scotland published a summary report about drug related deaths in Scotland (2004). In 2004, there were 356 drug-related deaths. Of those who died 87% were under 45 years and almost a quarter were under 25 years. Thus drug related death is a concern for young people in Scottish society, particularly in the West of Scotland, where the present study took place. Furthermore, illegal drugs may not just impact on health directly, but also indirectly, for example via violence or accidents (McKeganey & Norrie, 2000) and on social and family problems, crime and violence (Galbraith, 1999).

Health Promoting Schools

It is believed that schools could play a vital role in counteracting these problems. The Health Promoting School (HPS) concept, which currently guides school health promotion practice internationally, is based on the belief that schools have the potential to influence their students' health and health behaviour through the school's social

organisation, culture and physical environment, (within school practice and ethos), as well as through the formal curriculum (Gordon & Turner, 2001; Parsons, Stears, Thomas, Thomas, & Holland, 1997; World Health Organisation, Council of Europe, & Commission of European Communities, 1993). However, the HPS literature places its emphasis upon how best to help schools become more health promoting and does not link increased HPS activity with its impact on pupil outcomes (Denman, Moon, Parsons, & Stears, 2002; Parsons, Stears, Thomas, Thomas, & Holland, 1997). Even the very recent evidence that does exist to link outcomes to levels of HPS activity have a narrow focus in that only a few dimensions of within-school practice and ethos have been explored (Aveyard, Markham, & Cheng, 2004; West, Sweeting, & Leyland, 2004). Understanding fully the associations between within-school practice and ethos, and pupils' health behaviours is crucial to developing an evidence-based approach to "Health Promoting Schools". At present schools are progressing towards the HPS ideal largely as an act of faith and there is a need to empirically test the impact of this on pupils.

'School effects' research

One conceptual aid to understanding the effectiveness of the HPS is to be found in the 'school effects' literature, although, to date, 'school effects' research has predominantly focused on academic outcomes (Reynolds, Bollen, Creemers, Hopkins, Stoll, & Lagerweij, 1996; Reynolds, Sammons, Stoll, Barber, & Hillman, 1996).

A 'school effect' is when variations between schools in a given outcome (e.g. smoking rates among pupils) remain after adjusting for factors known to predict that outcome (Fitz-Gibbon, 1996). This is important as there can be great variation between schools in pupil composition; that is the socio-cultural backgrounds of pupils can vary enormously between schools, and aspects of their background such as family structure, parents' health behaviours, and social class might explain between-school variation. Thus without adjusting for such predictors it would not be clear whether the difference in health behaviours between schools was due to variation in pupil composition or due to a school effect.

'School effects' can be due to within-school practice and ethos which reflects the characteristics of schools. Within-school practice and ethos include the quality of relationships between different groups within the school (e.g. teacher-pupil, pupil-pupil and teacher-teacher); pupil attitudes to school, involvement and engagement (e.g. like school, feel safe in school, feel part of school, share worries with teachers); academic focus / caringness / inclusion; physical appearance of the school / environment; discipline within the school and health related policies (e.g. Health Education and Health Promotion policies).

The Argyll & Clyde study

The Argyll & Clyde study aimed to increase the understanding of the relationship between school processes and the health behaviours of pupils.

The study took place in a West of Scotland local authority (Argyll & Clyde) which covers a variety of social geographies in terms of rurality, wealth and other characteristics. Eight secondary schools, selected to represent the range of geographical, socio-economic and denominational characteristics of schools within Argyll & Clyde, were involved in the study (all schools approached agreed to participate). The data were collected as part of a wider HPS initiative that the lead author was involved in between October 1991 and September 1993 (Henderson, Coggans, & Davies, 1993).

Three key questions

The Argyll & Clyde study aimed to answer three key questions:

- What is the extent of the variation between schools in smoking, drinking and drug use?
- Is there still any variation (i.e. evidence of school effects) after adjusting for differences in the pupil composition of schools?
- Is there any evidence that the schools' health education and promotion activities, as well as more general aspects of relationships and communication, are associated with these school effects?

Mixed methods approaches

The Argyll & Clyde study used mixed methods approaches which fitted well with these different types of questions. Three methods were used.

First, self-reported questionnaire data on the health behaviours and socioeconomic background of 446 pupils (about 25 S2 pupils (12/13 years) and 25 S4 pupils (14/15 years) from each of the eight schools were collected under examination conditions by a trained researcher, with no teachers present. These data were used to ascertain whether there were any school effects on health behaviours and to select three case study schools which differed significantly in terms of pupils' health behaviour.

Second, information on health education and promotion activities was gathered from 183 semi-structured interviews with a range of staff and pupils across the schools. The interviews covering questions relating to health education, health promotion and ethos including quality of relationships (these data were collected first, so that knowledge of school effects would not influence the interviews). Data from the three case study schools' were analysed in depth to explore the relationship between within-school practice and ethos (health promoting levels) and pupils' substance use.

Third, an audit of each school's health education and health promotion activities was completed by all Principal Teachers in each school. The data were used to assess whether there was an association between levels of health education and health promotion activities and levels of pupils' substance use.

'School effects' analyses

The 'school effects' analyses adjusted for sex, age, social class, family structure and parental health behaviours (for each outcome the parental health behaviour for that outcome was included). The multivariate analyses fitted school as a fixed effect as the study was linking the 'school effects' to school processes within a particular group of schools. The analyses combined boys and girls, and pupils from two different school years (pupils aged 12/13 and 14/15). Outcomes assessed included current smoking, weekly drinking and whether ever tried drugs.

Results

For each of the outcomes there was a marked difference between the schools (unadjusted for pupil composition). For smoking, the lowest rate was 8% and highest was 34%, for weekly drinking 10% and 33%, and for ever tried drugs 17% and 37%. For both males and females there was, as expected, a significant increase in these behaviours with age (from 12/13 to 14/15).

After adjusting for differences in pupil composition, there were still differences between the schools, for smoking and to a lesser degree drinking, but not for use of drugs. Pupils in the poorest performing school were 11 times more likely to smoke than those in the best performing school. For drinking, the school with the poorest performance had pupils 4 times more likely to drink than the school with the best performance. These results addressed the first key question of this study (to establish school effects) and, in addition, provided the means by which three case study schools were selected.

Case study schools

The case study schools were selected on the basis of smoking rate, as this showed the strongest school effect. The schools selected were Bruce for 'best performance' and Seaview and Jude for 'poor performance' (the names of the schools have been changed to maintain confidentiality). The reason for selecting two schools with 'poor performance' was because the school with the poorest performance (Seaview) was a rural, island school and also more affluent than Bruce, thereby posing problems for comparison. Jude was also significantly different from Bruce in terms of smoking rates, but had the advantage of being located in the same town and had similar level of deprivation among pupils.

The audit data were analysed to assess whether there was any evidence that schools' health education and promotion activities were associated with these school's smoking rates. The results clearly indicated that higher levels of action on health education and health promotion were associated with good outcomes for smoking.

Bruce (lowest rates of smoking) was the most active school with regard to implementation of health education and health promotion. Bruce:

- ✓ taught Social Education to a range of year groups
- ✓ had improved the school physical environment
- ✓ had undertaken health promotion initiatives for pupils including a Health Fair (health professionals set up information stalls and pupils had the chance to talk to them and pick-up information leaflets)
- ✓ held a No Smoking Day (with activities and information on the topic of smoking) and encouraged extra-curricular physical activity for pupils
- ✓ provided a rest room for staff, a relaxation course and fitness opportunities for staff

Staff at the school reported the following 'facilitators' of their action: co-operation of staff, access to Education Division (Local Education Authority) funded Health Education Development Officer (HEDO), availability of funding for health education and promotion and the establishment of a school Health Committee. The obstructions to action were large class sizes which were felt to be a disadvantage to the teaching methods involved in health education and lack of time.

Jude and Seaview, both with significantly higher rates of smoking than Bruce, had been much less active, in both health education and promotion, than Bruce. Jude had run a parents' workshop on HIV / AIDS. Seaview had run the same workshop, but also taught HIV/AIDS education. Both schools cited the HEDO as a facilitator. Staff cited 'lack of focus', lack of time, continuing change and arrival of new material which necessitated further updating a recently updated course and change of remit of staff involved as obstructions to further action.

Complementing the audit, the case studies provided evidence not only on the schools' health education and promotion activities, but also on more general aspects of relationships and communication. This information was used to assess an association between these dimensions and school smoking rates. This information was also designed to allow an evaluation of how well the schools approximated to the HPS concept.

The dimensions of relevance were: health education and health promotion with reference to policies, packages and practice; ethos covering Head Teacher leadership, teacher involvement, communication (all categories of staff), teamwork (whole school versus individual departments), relationships between teachers, teacher-pupil and pupil-pupil and parental/community involvement.

Summary

In summary, the conclusion from the case studies was that Bruce performed best across all the areas explored in the case studies and this may explain its low smoking rate. Jude performed poorest across all the areas, which may plausibly be related to its high smoking rate. The third school, Seaview, sits between the other schools on a HPS continuum and as such its practices did not so clearly explain its high smoking rate. Bruce's key strengths over Seaview were its whole school approach to communication and involvement and higher levels of involvement of parents and professionals from the local community. In these dimensions, Bruce was on a different level and this probably explains the differences in smoking rates between Bruce and Seaview. However, it is important to note that this study cannot rule out the possibility that smoking rates are further influenced by area effects beyond the school.

Triangulation

An advantage of using mixed methods is that it provides the opportunity to examine whether data from different methodologies (e.g. survey, audit and qualitative interview data) or types of participant (e.g. pupils versus teachers or senior management team versus classroom teachers) yielded information that is coherent and consistent.

While the audit and case studies broadly provided the same message about the three case study schools, it was clear that the audit was less sensitive in picking up the extent of action in each school.

Bruce

Bruce had the lowest smoking rate of any school in the sample, performed consistently well in the audit and was consistently impressive in the case study. Bruce's results are robust across the three methodologies and reports were consistent across pupils, teachers, Principal Teachers and Senior Management Team, suggesting that they were reporting on the same reality.

Jude

Jude's results were the poorest of all schools in terms of the audit, case studies and pupil outcomes (high rate of smoking), so like Bruce, Jude fits the HPS theory well. In addition, and contrasting with Bruce, the case study reports across and between, teachers, Principal Teachers and Senior Management Team were inconsistent. Such inconsistency is interpreted as evidence of poor within-school communication.

Seaview

Seaview's performance in the audit and the results of the case study also displayed consistency, and with respect to both appears between Jude and Bruce. This suggests that its smoking rate was higher than would be expected given its position between the other two schools. However, it should be noted that Seaview had barely implemented health promotion and was not as active in health education as Bruce (message consistent across the audit and case studies), so it is possible this lower activity is part of the explanation for Seaview's high smoking rates. As described above, the within school communication was weaker than Bruce, as Seaview did not communicate (nor act) as a whole school, but rather worked as a cluster of departments. It is also possible that Seaview's island/rural location influenced pupils' smoking rates over and above that of the school.

On balance, triangulation suggests that the findings of this study are robust across methodologies. Seaview sits least well in the relationship between school processes and pupil smoking. However, it was envisaged at the outset that Seaview might represent a deviant case due to its very different type of location.

Discussion

It would have been preferable to have included more schools in this study. However, recently published work in this area, based on more schools and larger samples than the Argyll & Clyde study, has compatible findings, with smoking showing a school effect in both studies (Aveyard, Markham, & Cheng, 2004; West, Sweeting, & Leyland, 2004) and the strongest school effect where more health behaviour outcomes (other outcomes, including alcohol use, drug use and diet) were studied (West, Sweeting, & Leyland, 2004). The Argyll & Clyde study found a modest school effect for drinking, but not for drugs, whereas West et al. found modest school effects for both drinking and drug use. This suggests that a school effect on drug use may have been found had this study had been larger, though it could also reflect a temporal difference as West et al.'s study was conducted 10 years later than the Argyll & Clyde study. It is possible that these outcomes are linked more closely to 'neighbourhood effects' rather than school, so for instance, pupils living in similar neighbourhoods may have been more similar than pupils living in different types of neighbourhood but attending the same school.

The audit data and interview data from teachers and pupils showed that the Argyll & Clyde study findings fulfilled predictions from the HPS model. These results confirm the importance of within-school practice and ethos on students' health behaviour, particularly smoking, and are consistent with a school-wide or "Health Promoting School" approach to improving health behaviours.

This supports current policy whereby the Scottish Executive funded a Health Promoting Schools Unit to work with and encourage every school in Scotland to become a Health Promoting School. Similar developments have taken place in England in the form of the National Healthy School Standard.

Future studies will be able to explore whether 'school effects' impact differentially on both genders. It would also be beneficial to develop longitudinal studies and ideally, follow pupils from primary to secondary education, as did the 11-16 study (West, Sweeting, & Leyland, 2004). This can allow the impact of associated primary schools to be built into research on secondary schools, such that pupils' health behaviours prior to entering secondary school could be taken into account. Similarly, longitudinal work allows adjustment for prior behaviour. It is also the case, given the importance of family influences, that it would be helpful to collect data directly from parents that could be linked to the data of their child(ren). It would be interesting to assess the impact of increased partnership between schools and parents and the impact of health and / or parenting interventions for parents.

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