

## School health education and gender: an interactive effect?

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### Abstract

Post-primary school students ( $n = 2407$ ) and young adults ( $n = 477$ ) participated in a cross-sectional evaluation of a health education programme for schools. The Lifeskills programme is based on a philosophy of student empowerment, and aims to teach knowledge and skills relevant to health promoting behaviour. School students were recruited in schools, while young adults were opportunistically recruited in workplaces, training centres and on public transport. Those who attended schools where Lifeskills had been taught and who remembered such lessons were conservatively classified as the intervention group, while those who attended other schools and did not remember such lessons were classified as the comparison group. Participants completed questionnaires designed to collect data on health-related behaviours, indicators, knowledge and psychological health. School-level factors were employed as covariates in subsequent analyses of covariance. Amongst younger pupils, females reported more positive health behaviours but lower levels of psychological well-being and more symptoms. The impact of the programme became evident at ages 13–15. Those involved drank less and reported more positive adjustment to school. However, sex differences remained, with females reporting more health-promoting behaviour and

more symptoms, and lagging behind males in self-esteem and general well-being. An interaction between gender and the intervention was identified among senior pupils. Exposure was especially beneficial for females. However, as young adults, the two main effects of gender and programme participation re-emerged as the most important independent variables, and the interaction between them was not significant. This pattern has implications for the interpretation of evaluations conducted on short-term interventions as well as for short-term impact evaluations.

### Introduction

The Irish public health system divides the country into eight regional Health Boards, each of which is responsible for the development and implementation of regional health strategy. These responsibilities include health promotion and health education. Historically, liaison between the health and education services has been primarily encouraged and supported within the health sector by individual Health Boards, each of which has adopted its own approach according to the perceived demand from its constituency or available personnel. Some have concentrated on materials development, others on the provision of in-service training for teachers. Some have dealt almost exclusively with one educational sector, others with all. In general, the Irish approach to school-based health education has been described as 'ad hoc' (Metcalf, 1993). However, it has also been characterized as amongst the best in Europe (Williams, 1991).

An integral part of the health promotion strategy

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of the North Western Health Board (NWHB) is the Lifeskills programme for schools which is offered to all schools within the region. Introduced to second-level schools (pupils aged 12–18) in 1981 and primary schools (ages 4–11) in 1991, the programme's philosophy is one of empowering young people through equipping them with a variety of skills for choosing healthy behavioural options (McLoone and McAuley, 1985).

The main components of the NWHB's promotion of this programme have been the development of materials, including lesson plans, and in-service teacher training on educational aspects of health promotion and personal development. All teachers are offered annual refresher courses immediately before the new school year begins. These courses comprise teaching methods, guidelines on management and administration, and topic-specific input based on curriculum content. In most schools, pupils receive one class a week (about 45 min) in Lifeskills. However time-tabling can vary from four classes per week to none. Nevertheless, Lifeskills is now the most comprehensive schools' health education programme in the country.

The policy context of this field has developed and changed substantially since the inception of the Lifeskills programme in 1981, resulting in increasing calls for comprehensive reviews and research into current practice [e.g. (Metcalf, 1993)]. Similar appeals for research and development have also come from other countries, including the US (Corry, 1992), Canada (Hart-Zeldin, 1990) and Australia (Coonan *et al.*, 1990). In addition, the widescale introduction of the health-promoting school (HPS) concept throughout Europe (Parsons *et al.*, 1997), which focuses on a more holistic view of the school as a setting for health promotion, renders it timely to assess as accurately as possible what has already been achieved in various contexts. One of the major tenets of the HPS model is the introduction of a health education curriculum. The Lifeskills programme contributes just such a curriculum. It is in this context that the current evaluation was conceived.

Numerous authors discuss the importance of

appropriate methodology, focusing on the use of quasi-experimental designs in evaluating health promotion [e.g. (McKinlay *et al.*, 1989; Murray *et al.*, 1989)]. However, no baseline data were collected prior to the implementation of the Lifeskills programme. Neither has there been any simple random or stratified allocation to intervention groups. Each school has been free to customize the programme to its own perceived requirements. As a result it is only possible to conduct a quasi-experimental evaluation (Best, 1989). Rather than being able to address the question whether this programme can have an influence on pupils (efficacy), it is only possible to ask whether the programme as implemented has an influence (effectiveness). In addition it has been necessary to compare the intervention group to a comparison rather than a control group and accordingly to investigate sources of non-equivalence between the groups.

While gender and social class effects are relatively common factors associated with various health behaviours and attitudes (Friel *et al.*, 1999), measures of psychological well-being have also been found to vary between socio-demographic groups. Perceived control over life circumstances is inversely distributed by social status (Thoits, 1995). For example, research evidence indicates that females, minority group members, and those of lower education and income exhibit higher fatalism or a lower sense of mastery, personal control or internal locus of control [see reviews in (Mirowsky and Ross, 1989; Turner and Roszell, 1994)].

Health education or school-based health promotion is often assumed to have uniform effects on students. Of particular relevance to the present study is the frequent failure in evaluation of specific and comprehensive health education promotion interventions to present findings by gender [e.g. (Connell *et al.*, 1985; Moberg and Piper, 1990; Arbeit *et al.*, 1992; Nutbeam *et al.*, 1993; Morgan, 1997)] or even to control for gender effects (Ashworth *et al.*, 1992; Kooler and Bruvold, 1992; Schonfeld *et al.*, 1995; Hausman *et al.*, 1996). Where gender is included as a variable, findings

are inconsistent. For example, Edmundson *et al.* report on absence of gender interactions in their evaluation of a child and adolescent trial for cardiovascular health (Edmundson *et al.*, 1996); Duitsman and Cychosz and Snow *et al.* found no gender effects in their evaluations of drug education (Duitsman and Cychosz, 1997; Snow *et al.*, 1997); and Ary *et al.* found no gender differences in the efficacy of school-based smoking prevention (Ary *et al.*, 1990). Others, however, have reported differential effects on females and males. Arborelius and Bremberg reported more significant differences for female pupils than for male pupils on a variety of outcome measures in a quasi-experimental evaluation of a student-centred model of health education (Arborelius and Bremberg, 1988). In contrast, Holcomb *et al.* reported a greater impact on males of a date-rape prevention intervention (Holcomb *et al.*, 1993) and O'Leary *et al.* found a stronger influence on males following an AIDS prevention programme (O'Leary *et al.*, 1996). Such differences may be attributable to a variety of factors, including the design and implementation of the intervention. Nevertheless, they highlight the relevance of including analysis by gender in any evaluation plan.

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### Method

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This paper reports on two research strands in an evaluation of the Lifeskills programme: those concerned with post-primary school students (aged 12–17) and adult 'graduates' of the Lifeskills programme, i.e. young adults (aged 18–25) who had received Lifeskills classes while they were in school. Both groups were assessed using a standardized self-completion questionnaires and were compared to constructed comparison groups.

#### Participants and procedure

A random sample of classrooms in all post-primary schools in the NWHB were invited to participate. The sampling frame comprised individual class groups. The self-report responses of these students were compared with those of a comparison group of pupils in randomly selected classrooms from 12

post-primary schools in an adjacent Health Board area. The post-primary school students were categorized according to whether they could remember receiving Lifeskills or health education classes. Those from schools where Lifeskills was taught and who recalled such classes were categorized as Lifeskills+, those who were from schools where no Lifeskills or health education was taught and who did not recall any such classes were categorized as Lifeskills–.

An opportunistic sample of young adults from the region who had experienced the programme was obtained from several sources as follows. (1) Two centres of the state vocational training agency FÁS agreed to assist in data collection, and released trainees from classes and workshops to complete questionnaires in a classroom setting with research staff. (2) Two large factories in the region also agreed to distribute questionnaires to employees who were under 25. Questionnaires with stamped return envelopes were duly sent through internal company mail. Factory respondents were also given the option of returning completed questionnaires through a post box located close to their respective staff rooms. Posters to encourage returns were placed in various locations throughout the two plants and two sets of reminders were also distributed directly to potential participants. (3) Students in third-level education: there is no university in the NWHB region and young people from the area frequently attend university or technical college in the nearest large city, which is a 2–3 h drive away. Local entrepreneurs provide private buses from this city to various parts of the NWHB region and they agreed to allow researchers to travel on these buses with the aim of recruiting participants. During a total of 14 bus journeys, researchers approached all passengers individually and explained the purpose of the study according to a strict research protocol. Although all those aged under 25 from the NWHB were included in this study, they were not all third-level students, and thus the sample also included employed and un-employed young adults.

The adult sample was divided into Lifeskills+ and Lifeskills– groups using the following criteria:

those who had been in schools which reported teaching Lifeskills during the time they were in school and who remembered receiving some form of health education were classified as the Lifeskills+ group. Those who were at schools which did not teach the Lifeskills programme and who could not remember receiving any form of health education were classified Lifeskills-. These participants were assessed using a standardized questionnaire battery analogous to that employed with the post-primary students.

Two separate pilot studies were undertaken, the first with second year post-primary pupils, aged 13–14 ( $n=30$ ) from a third health board area, the second with adult post-graduate students, aged 22–30 ( $n=23$ ). Both were intended to help assess the suitability of the measurement tools for the target groups.

### Measurement

Principals in all schools completed a specially devised short one-page questionnaire containing questions on structural aspects of the school (teacher and pupil numbers, estimated percentage of pupils from rural backgrounds) as well as a series of items relating to the concept of the HPS (Nic Gabhainn and Kelleher, 1995, 1998). HPS attitudes refer to the principal's stance towards the concept, while HPS policies refer to the number of current policies reported. These were assessed as potential school-level differences between respondents as mentioned above.

The core section of the Health Behaviour in Schoolchildren (HBSC) Questionnaire was employed to assess self-reported health behaviour, attitudes and symptoms. The HBSC questionnaire was initially developed by an international group of multidisciplinary researchers [e.g. (Aaro *et al.*, 1986)], working with the support of the World Health Organization (European Office). The stated purpose of the HBSC is to document the behaviours of children so as to inform health promotion strategists in the various countries. Every 4 years, random samples of not less than 1500 young people aged 11, 13 and 15 year in each collaborating country are taken (Aaro and Wold, 1989). Over

30 countries are now involved in this study and the data collected are readily comparable notwithstanding the usual problems in cross-national interpretation. The core section of the questionnaire is those parts which have remained constant over time and are used in all participating countries, and includes demographic questions concerning parental occupation, gender and household composition. Social class was determined from parental occupation according to the Provisional Irish Social Class Scale (O'Hare, 1982).

In addition to the HBSC questions on health behaviours, attitudes and symptoms, a number of measures of psychological health were selected for inclusion according to relevance to the original objectives of the Lifeskills programme. McLoone and McAuley describe Lifeskills teaching as 'education for living' (McLoone and McAuley, 1985), which should enhance students' self-esteem and belief in their capacity to control their own life. In order to assess these aspects of psychological health the following questionnaires were administered to the pilot participants.

#### *Internal reliability*

- The Rosenberg Self-Esteem Scale (Rosenberg, 1965), which attained  $\alpha$  scores in the pilot studies of 0.73 (children) and 0.86 (adults).
- The General Well Being Questionnaire (Cox *et al.*, 1983; 1984), which has two subscales: worn out and uptight (childrens  $\alpha = 0.79, 0.79$ ; adults  $\alpha = 0.81, 0.86$ )
- The Childrens Locus of Control Scale (Nowicki and Strickland, 1973) achieved a Kuder-Richardson coefficient of 0.12.
- The Multidimensional Health Locus of Control (Wallaston *et al.*, 1978) which attained  $\alpha$  values of 0.10–0.40 for the children and 0.30–0.88 for the adults.
- The Mastery Scale (Pearlin and Schooler, 1978, 1981) ( $\alpha = 0.49$  and 0.73, respectively)
- The Social Adjustment Questionnaire (Weissman *et al.*, 1971,1978), which has six subscales: work, leisure, family unit, partner, children and extended family (partner and children were omitted for school students). The

$\alpha$  values were 0.51–0.68 for the children and 0.51–0.84 for the adults.

- Finally, a 15-item knowledge questionnaire was constructed based on the content of the post-primary Lifeskills curriculum. This questionnaire was also administered to the post-primary school pilot participants, where it attained a Kuder–Richardson coefficient of 0.75.

Those which exhibited most adequate internal reliability as well as acceptable distributions were subsequently employed with the study participants. These comprised: the HBSC core questions, the Rosenberg Self-Esteem Scale, the Mastery Scale, the General Wellbeing Scale, the Social Adjustment Questionnaire and the Knowledge Questionnaire. Slightly different versions of the final research instrument were developed for adult and youth participants. For example, the adults were asked about school in the past tense and the young people were not asked about relationships with their children or partners.

### Analyses

As in other situations where data are collected from existing groups, the potential for group effects is present. One response would be to treat the classroom or the school as the unit of analysis. The difference in the number of schools in the comparison and intervention groups is also relevant to this question, because there are fewer schools ( $n = 12$ ) in the comparison group, the potential for school effects is greater. In relation to classroom effects, Roberts *et al.* (Roberts *et al.*, 2000) present design factor values calculated on the international HBSC data. These vary by age group, country and variable, e.g. for frequency of exercising they range from 1.09 to 1.41, for eating burgers they range from 1.01 to 1.43 and for smoking from 1.20 to 1.71. Thus these should be considered when interpreting the data presented in Table I.

The individual students were chosen as the unit of analysis for three reasons. The potential for individual differences in exposure to Lifeskills is high. Detailed notes on implementation have not been kept by teachers, students or schools, so it is impossible to ascertain exactly how much exposure

any individual pupil has had. It is likely that the level of exposure varies within any individual classroom as well as within schools and thus amalgamating the class for analysis would mask this variability. Second, the region is the most rural in the Republic of Ireland and students from many different social backgrounds sit together in classrooms. In rural Ireland, post-primary school pupils are very rarely educated separately by gender or social status. Such variables are known or hypothesized to have be associated with health status and reported health behaviour on health (Nolan, 1994; McDermott *et al.*, 1997; Riley *et al.*, 1998). Therefore, treating the class as the unit of analysis would mask the range of socio-demographic strata in the room. Finally, employing the individual rather than the class as the analysis unit maximizes statistical power.

Multiple analyses of covariance were carried out employing gender, social class and group as independent variables, and the reported health-related factors as the dependant variables. In addition, educationalists [e.g. (Finlayson, 1991)] strongly recommend the consideration of ‘school factors’ when interpreting work of this nature. This refers to such variables as school size and type; the nature of a school’s philosophy or ethos should also be taken into account. Obviously these factors could have an important effect on students behaviour, attitudes and feelings, but also on the quality of support given to the programme and hence its level of implementation within the school. The data collected from principals regarding the school and the HPS attitudes and policies were employed to address these issues. Possible effects of school type were controlled by employing gender of pupils, social class make-up, rurality, HPS attitudes and HPS policies, and school size as covariates when they varied significantly between groups. These analyses were conducted according to guidelines suggested by Tabachnick and Fidell (Tabachnick and Fidell, 1993) and Wildt and Ahtola (Wildt and Ahtola, 1978).

For the young adults, age, gender social class, number of years of full-time education, possession of a post-school qualification and rurality were all

**Table I.** Percentages of school students and young adults reporting health behaviours, attitudes and symptoms on the HBSC questionnaire by Lifeskills status

Dependent variable	Group			
	School students		Young adults	
	Lifeskills–	Lifeskills+	Lifeskills–	Lifeskills+
Ever smoked	55	50	72	68
Smoke at least weekly	22	19	49	49
Ever drunk alcohol	86	78	95	93
Who have felt 'really drunk' <sup>a</sup>	44	27	26	11
Exercising 4+ times per week	48	44	25	17
Brushing teeth at least daily	87	92	94	92
Drinking fizzy drinks daily	54	46	37	38
Eating fruit at least daily	66	70	50	48
Eating burgers at least daily	9	6	5	7
Eating chips at least daily	24	21	26	23
Eating crisps at least daily	45	45	26	23
Eating sweets at least daily	72	77	37	36
Reporting stomach-aches often	9	13	5	8
Reporting being nervous often	13	13	13	10
Reporting feeling low often	16	15	9	8
Feeling very healthy	19	14	84	78
Feeling very happy	26	29	93	91
Watching TV 4+ h per day	20	15	12	11
Always wearing seat-belt	36	31	54	48
<i>n</i>	795	825	129	188

<sup>a</sup>This reflects those school students who reported that they had *ever* felt 'really drunk' and those adults who reported that they had felt 'really drunk' 10 or more times.

explored as sources of non-equivalence between groups. These two groups of adults differ significantly on only one possible covariate. The Lifeskills+ group are less likely to report that they had achieved further qualifications after leaving school. Thus receipt of a further qualification was employed as a covariate in subsequent analyses for the young adults.

## Results

### School students

A sample of 971 students from 33 post-primary schools in the NWHB area returned completed questionnaires. This represents 77% of those classrooms who were invited to participate. In the comparison group, 92% of selected classrooms

responded positively and a total of 1436 completed questionnaires were returned from these pupils. Of these, 795 were classified as Lifeskills– and 825 as Lifeskills+.

### Young adults

In total, 477 completed questionnaires were returned from young adults as follows. (1) Eighty-five percent of the registered FÁS trainees were present on the day and all agreed to participate. Thus 220 completed questionnaires were returned. (2) In total, 25 responses were received from the first factory, representing 27% of the under 25s employed in the factory. Thirty-five responses were received from the second factory, representing 64% of the under 25s employed there. The differences in response rate are attributable to various person-

**Table II.** Psychological health of school students and young adults by Lifeskills status

Lifeskills status	Group			
	School students		Young adults	
	Lifeskills–	Lifeskills+	Lifeskills–	Lifeskills+
Self-esteem [mean (SD)]	37.88 (6.62)	34.30 (7.34)	39.47 (6.78)	38.26 (7.06)
Mastery [mean (SD)]	20.70 (3.32)	20.13 (3.41)	14.84 (2.44)	15.20 (2.41)
General well-being [mean (SD)]	68.75 (9.98)	64.70 (10.76)	69.30 (10.51)	67.94 (9.65)
Knowledge score [mean (SD)]	15.25 (3.88)	15.13 (4.16)	16.84 (4.08)	17.34 (3.61)
<i>n</i>	795	825	129	188

ANOVA analyses reveal no statistically significant differences between intervention and comparison males or intervention and comparison females.

nel and industrial relations difficulties in the first factory during the period of data collection. (3) In total, 197 completed questionnaires were returned by bus passengers out of 284 distributed (69%). Fifty percent of these respondents were female and their mean age was 23.85, 75% were single and 48% reported that they lived in the countryside, 53% reported that they had attended post-primary school in the NWHB with a mean of 14.56 years of full-time education. These young adults were subsequently classified as Lifeskills+ ( $n = 188$ ) and Lifeskills– ( $n = 129$ ), according to the criteria outlined above.

### Descriptive analyses

The incidence of health behaviours, attitudes and symptoms (percentages) for both the school students and young adults are presented in Table I.

Mean scores on the measures of psychological health and knowledge for all groups are presented in Table II.

### Inferential analyses

The results indicate different patterns across the various age groups (Table III). In the first 2 years of post-primary school (ages 11–13), most significant differences relate to gender irrespective of whether students were in Lifeskills classes or not. Although the females report more positive health behaviours, they also report more symptoms, and lower levels of self-esteem and general well-

being. In years 3 and 4 (ages 13–15), some gender differences remain but most differences are between the Lifeskills+ and Lifeskills– group, and the interaction between gender and Lifeskills begins to emerge.

In the final year (ages 16–17), there is a clear interaction between gender and receipt of Lifeskills. At this stage the Lifeskills+ pupils show an advantage in relation to reported drunkenness, and the gender differences on self-esteem and general well-being are maintained. Although a small number of social class differences were identified, these were not sustained across dependent variables or over years and are therefore not reported here. An illustration of the gender by Lifeskills interaction for senior pupils is contained in Figure 1. The dependent variable in this case is drinking beer. Figure 1 shows the increase in beer drinking across age groups and the retardation that occurs in this increase for Lifeskills females. These differences are non-significant at Year 1 ( $F = 3.02$ ; d.f. 1,164;  $P > 0.05$ ) but the interaction ( $F = 6.98$ ; d.f. 1,132;  $P < 0.01$ ) and simple main effects of gender and Lifeskills at Year 5 are statistically significant.

In young adulthood, most Lifeskills by gender interactions are not significant and three-way (gender×social class×Lifeskills) analyses of covariance illustrate a number of positive effects related to either gender or Lifeskills. Significant effects are presented in Table III. Substantial gender

**Table III.** Analyses of covariance

Year(s)/group	Item	G, L or G×L	d.f.	F
1-2	smoke fewer cigarettes	G	1,48	4.27*
1-2	eat fewer chips	G	1,213	8.01**
1-2	sat fewer burgers	G	1,216	6.73**
1-2	exercise less frequently	G	1,213	8.63**
1-2	more stomach-aches	G	1,212	16.01***
1-2	feel low more often	G	1,205	12.04***
1-2	lower self-esteem	G	1,215	6.91***
1-2	lower general well-being	G	1,209	10.13**
3-4	lower self-esteem	G	1,157	4.27*
3-4	lower general well-being	G	1,157	12.32***
3-4	drink less beer	L	1,223	8.28**
3-4	drink less cider	L	1,204	9.07**
3-4	less drunkenness	L	1,247	20.43***
3-4	less nervousness	L	1,214	5.44*
3-4	better adjustment to school	L	1,246	5.31*
3-4	less headaches	G×L	1,188	6.70**
3-4	less dizziness	G×L	1,186	11.80***
3-4	better adjustment to leisure	G×L	1,184	4.38*
5	lower self-esteem	G	1,157	4.27*
5	lower general well-being	G	1,157	12.32**
5	less drunkenness	L	1,114	12.32**
5	drink less beer	G×L	1,132	6.98**
5	drink less fizzy drinks	G×L	1,156	16.59***
5	eat fewer chips	G×L	1,157	4.07*
5	eat fewer crisps	G×L	1,156	3.93*
5	watch less television	G×L	1,156	11.17***
5	achieve higher knowledge scores	G×L	1,149	6.26*
Adults	smoke less	G	1,98	6.89**
Adults	less drunkenness	G	1,236	13.86***
Adults	eat fewer burgers	G	1,236	17.42***
Adults	exercised less	G	1,230	16.47***
Adults	more stomach-aches	G	1,234	20.88***
Adults	feel low more often	G	1,231	14.95***
Adults	lower self-esteem	G	1,241	8.54**
Adults	drink less beer	L	1,214	7.88**
Adults	drink less wine	L	1,155	4.15*
Adults	drink less coffee	L	1,227	6.99**

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

Pattern of gender (G), Lifeskills (L) and interaction (G×L) effects by post-primary year(s). Both simple and interaction analyses indicate findings true of females and those who have undergone Lifeskills training.

differences emerge amongst the adults which mirror those found amongst the younger school students. The main effect of the Lifeskills experience seems to be on participants drinking of beer, wine and coffee.

## Discussion

The main impact of the Lifeskills programme is related to substance use, specifically alcohol. By

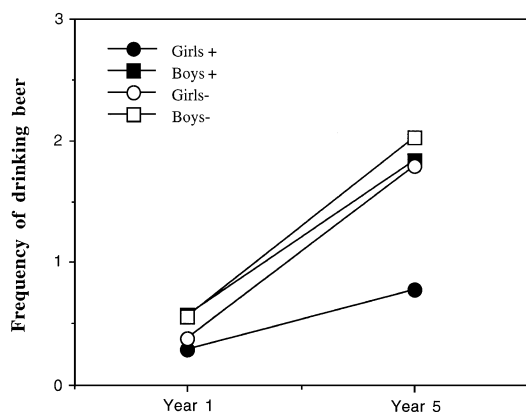


Fig. 1. Females benefiting from Lifeskills.

the time they were 15–16, Lifeskills+ children drank significantly less often and reported lower rates of drunkenness. These differences applied across all social classes in both males and females, and became more marked as they got older. Given that alcohol is the substance most widely abused in Irish society (Morgan, 1994), these results indicate an important impact of Lifeskills on drinking behaviour among young people and suggest that the programme makes a positive contribution in this area. However, the failure to detect the effects on other behaviours, especially smoking, should be noted. It is hypothesized that interventions targeting tobacco behaviour should begin at a much earlier stage in the development of health behaviours during the primary school years. From a research perspective closer attention should be given to the factors hypothesized as influencing both initiation into and maintenance of smoking behaviour in the Irish context.

The consistent effect related to alcohol behaviours throughout the age ranges suggest that the effect is likely to be real and related to the impact of the Lifeskills educational programme. However, it is possible that reported behaviours do not reflect actual behaviours. Nevertheless, the fact that Lifeskills+ pupils consistently report in this manner suggests at the very least the success of the programme as an educational tool about the boundaries of appropriate behaviour and hints at its efficacy in influencing perceived social norms regarding drinking behaviour.

When compared to 15-year-old children in other European countries and Canada (King and Coles, 1992) employing exactly the same HBSC questions, the NWHB 15 year olds in this sample reported less alcohol use than those in other countries and their pattern of use was remarkable. Although fewest of them had ever drunk alcohol (81% of males and 67% females), they were also most likely to report that they were weekly drinkers (47% of all males and 37% of all females), so fewer of them drank, but those that did drank regularly. In addition, the NWHB 15 year olds reported the lowest frequency of ‘ever having been really drunk’ (23% of all males and 15% of all females). It is unlikely that their perception of what ‘really drunk’ means differs substantially from those in all other countries, including Northern Ireland, Scotland and Wales, and therefore this may suggest that although these children drink regularly, they do so relatively sensibly.

Overall, the programme appears to have had a differential effect over time on the females, at least during the school years. While large sex differences characterize the responses of younger students, with females behaving more positively but feeling worse, by the time they reach the senior years, the females seem to be benefiting from exposure to a greater extent than the males. This benefit is identified across a range of behaviours and health indicators. Multiple analyses of covariances reveal that females who had received the Lifeskills programme reporting higher levels of well-being, fewer symptoms and more positive behaviours than males who had been similarly exposed and females who had not. These findings illustrate the importance of taking socio-demographic factors, especially gender, into account in any evaluation. They also illustrate the importance of sustained programming and the possibility of delayed effects. School students here did not exhibit substantial effects attributable to the intervention until their third year of post-primary school even though most had been in receipt of the programme for up to 2.5 academic years at that stage. This suggests that short-term interventions either may not be of

measurable benefit or that the effects of such are delayed, or indeed both.

If school students had been the only participants in this evaluation the gender patterns presented would result in a call for more emphasis to be placed on males and further investigation of the appropriateness of health education methods employed for such males. The added value of the current study lies in the addition of the adult 'graduate' group. While the evidence presented here suggests a sustained impact of the Lifeskills programme on alcohol consumption, it also highlights substantial gender differences. With the exception of exercise, females report more positive health behaviours, more symptoms, and lower levels of self-esteem and general well-being. In fact, many of the disadvantages and advantages females exhibit in early post-primary school are also present among young women. This emphasizes the importance of presenting gender-specific data when reporting research of this nature. Only by comparing the relative impacts on males and females of various interventions can those which optimize the health of both be identified.

These studies employed a variety of measurement tools to assess various aspects of the school setting and health-related behaviours of the individual school students and young adults. During the pilot phase some measures (e.g. the Childrens Locus of Control Scale and the Multidimensional Health Locus of Control) performed poorly in relation to their reliability and were not subsequently used. Although some of these standard questionnaires have been extensively validated in other settings (Nowicki and Strickland, 1973; Robinson and Shaver, 1976; Wallaston *et al.*, 1978; O'Connell and Price, 1982), reports of their use in Ireland have been limited and not characterized by in-depth psychometric analysis to date. The HPS attitudes and HPS policy questionnaires completed by the principals proved useful indicators of differences at the school level. There was considerable variability in the responses received which allowed for useful comparisons between schools. However, there is also an unknown level of social desirability bias and in future it would be useful to include

data on these topics from a wider section of the school community—teachers, pupils and parents.

In conclusion, this study is an example of an evaluation of an operational health education programme rather than one specifically designed and eagerly delivered for demonstration purposes. While the benefits of Lifeskills have shown themselves sustainable at least into early adulthood, the interactions with gender are interestingly short in duration. Health issues remain for females with almost the same advantages and disadvantage as indicated over the 10 years or so from early post-primary school to early adulthood. This finding illustrates the value of the difficult task of locating programme graduates and implies the potential benefits of employing a true longitudinal design for the evaluation of intervention programmes.

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