The Western Australian School Health Project: comparing the effects of intervention intensity on organizational support for school health promotion

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Abstract

The aim of this study was to evaluate changes in school health promotion practice related to two levels of intervention in the Western Australian School Health (WASH) Project: (1) a low-intensity intervention involving a single mail-out of WASH Project resources, and (2) a high-intensity intervention involving training, planning time and expert support. The schools involved in the study were divided into three groups. Treatment group 1 received the high-intensity intervention, treatment group 2 received the low-intensity intervention and a comparison group received no intervention. Two scales were developed to assess change, i.e. a school organizational scale (Chronbach’s $\alpha = 0.76$) and a health promotion activity scale (Chronbach’s $\alpha = 0.79$). The results indicate that a high-intensity intervention, such as the WASH Project, which provides training to a critical mass of school community members from each school, ongoing access to an expert in the field, as well as dedicated planning time, is able to increase the comprehensiveness and quality of health strategic planning by schools. Furthermore, the results suggest that a low-intensity mail-out intervention is no more successful in initiating change that providing no intervention at all.

Introduction

Current literature suggests that schools which provide comprehensive school health promotion programs are more effective in encouraging children to adopt health enhancing behaviours and in reducing health compromising behaviours than schools which provide health education alone (Allensworth and Kolbe, 1987; Green and Kreuter, 1991; Nutbeam et al., 1993; WHO, 1996a). The logic behind this assumption suggests that a school which comprehensively targets many behavioural influences, such as primary caregivers, siblings, peers, local community, extended community, non-parental role models, educational institutions and teachers, over several years, is likely to be more effective in initiating and reinforcing positive health behaviour among students (Hetzel and McMicheal, 1987; Joyce and Binstead, 1988; National Health Strategy Unit, 1992; Shilton, 1993; WHO, 1996a). Research into the effectiveness of comprehensive school health programs support the positive influence that such programs can have on student health behaviours (Connell et al., 1985; Parcel et al., 1987; Ellison et al., 1989; Hawkins and Catalano, 1990; McKane et al., 1990; Resnicow et al., 1991; WHO, 1996b). As a result, a well-considered, comprehensive approach that prioritizes the needs of students has been acknowledged widely by school health professionals as an important method of implementing school health (Kolbe, 1986; Pigg, 1989; Nutbeam, 1992; Seffrin, 1992; WHO, 1996a).

Since the early 1980s, various models of school health promotion have been developed which incorporate various fundamental and mutually sup-
portive components that influence children’s health behaviours (Rustia, 1982; Anderson and Creswell, 1985; Kolbe, 1985; Floyd and Lawson, 1992; UNESCO, WHO and UNCF, 1992; WHO, 1996; McBride and Midford, 1998). For the purposes of this paper school health promotion is broadly defined as a school which provides:

...each student...with planned, systematic, and ongoing learning opportunities designed to maximise the prospect that each student will be able to make health-enhancing decisions. Emphasis is placed on maintaining, reinforcing, and enhancing...health, health attitudes and practices, and health related skills. [(Seffrin, 1992), p. 394]

The method for providing these opportunities is through a:

...balance of curriculum and classroom teaching with action directed towards improving the school environment and improving links with the family, caregivers, and the wider community. [Nutbeam et al., 1993], p. 221]

These broad definitions of school health promotion were selected as they provide the best overall representation of the aims and conceptual underpinnings of the school-based intervention study under consideration in this paper. Other models, such as Kolbes ‘School Health Promotion Components and Outcomes’ (Kolbe, 1985) assisted in identifying a more comprehensive list of components for targeted health promotion activity.

Encouraging schools to adopt comprehensive health promotion programs, however, is often difficult given the current educational climate of devolved decision making, crowded curriculum, increasing number of curriculum areas vying for status and time on the school’s agenda, and industrial disturbances. Seffrin [(Seffrin, 1992), p. 394] comments that:

...the gap between common practice and ‘what ought to be’ is greater for health education than for most other areas in the school curriculum.

A review of publications discussing barriers to the implementation of school health education and promotion programs indicates that the most common barriers relate to school-level administration/management factors, including lack of resources, lack of time, lack of funding, lack of staff, lack of teacher training, lack of an expert coordinator, competing demands and lack of administrator support (Coonan and Owen et al., 1990; Nutbeam, 1992; Butler, 1993; Resnicow et al., 1993; English, 1994; McIntyre et al., 1996). Coonan et al. (Coonan et al., 1990) comment that the barriers to school health implementation have not changed for the last 15 years, suggesting that the issue remains a low state and national priority.

**Study design**

This study adopted a quasi-experimental research design to evaluate changes in school practice, supportive of health promotion, related to two levels of intervention in the Western Australian School Health (WASH) Project. The two levels of intervention included: (1) a low-intensity intervention involving a single mail-out of WASH Project resources, and (2) a high-intensity intervention which encouraged schools to adopt school health promotion by providing teachers and parents with training in school health promotion, time to plan and implement school health promotion activities, and professional expertise to facilitate the process of change (McBride et al., 1996).

**Methodology**

**Sample**

The study employed matched comparison schools, with a series of three data collection points over a 22-month period. Pre-testing occurred at the beginning of the school year prior to the interventions, post1-testing at the end of the same school year after the interventions and post2-testing at the end of the following school year. The schools involved in the study were divided into three groups.
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(1) The first treatment group ($\mu_1$) consisted of WASH Project primary and district high schools receiving the full project intervention (high intensity) ($n = 11$).

(2) The second treatment group ($\mu_2$) consisted of an equal number of primary and district schools, matched to the WASH Project schools on a one-to-one basis (low intensity) ($n = 11$).

(3) The third group ($\mu_3$) was made up of matched comparison schools. This group of primary and district schools received no intervention ($n = 11$).

Given that the WASH Project was primarily an intervention conducted by practitioners, the evaluation component is effected by a number of limitations. In particular, assignment of schools into treatment groups was not a random procedure. Initially, treatment group 1 schools self-selected to participate in the WASH Project intervention. Treatment group 2 and comparison schools were selected as matched equivalents for treatment group 1 schools. Each school was matched as closely as possible on the following matching variables:

1. Priority schools program index (socio-economic) (Giddings and McDonald, 1992).
2. Level of priority school program funding (Education Department of Western Australia, 1994).
3. School location (Education Department of Western Australia, 1994).
4. School type (primary, district high) (Education Department of Western Australia, 1994).
5. School classification and population (teacher to student ratio based on student population) (Education Department of Western Australia, 1994; Western Australian Ministry of Education, unpublished).

Baseline assessment of general association between school type and a number of other possible confounders identified secondary schools as significantly different from primary and district high schools. As a result, secondary schools were excluded from the study. The limitations associated with this selection process should be taken into account by the reader when interpreting and assessing the results.

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**Procedure**

**Intervention procedure**

The WASH process of operation at each individual school differed from traditional school professional development in a number of ways. Firstly, the WASH Project required participating schools to elect a school health committee made up of a cross-section of school administration staff, teaching staff, support staff, parents and other nominated school community members. Secondly, 2 days training in school health promotion, specific health issues, local health resources and school health planning was provided for all health committee members. Thirdly, the WASH Project provided a series of four half day meetings for each school health committee to plan and implement health promotion programs. An important aspect of the WASH Project was to encourage each school to maximize local ownership and control. Consequently, the planning process was structured to provide all members of the school community with decision-making opportunities. The facilitation of school health meetings was undertaken by the external project coordinator who attended and facilitated all health planning meetings at each school.

During the period of this study, the central WASH Project budget provided funding to cover total teacher-release costs for school health committee meetings, training for school health committee members, teacher-release time to develop a school health policy and a nominal amount to purchase school health resources. The total amount of funds allocated to each school using this model was approximately AU$5000 per school excluding project officer salary, office support, vehicle costs and printing (AU$6800 per school all inclusive). Process evaluation was undertaken to assess if the intervention was implemented as intended. Evaluation observations indicated that for each treatment group 1 school participated, all planned aspects of the WASH Project.
The following WASH Project resources were sent to treatment group 2 schools: WASH Express (project newsletter), School Facilitators’ Handbook, Compendium of School Health Promotion Activities, Healthy School Index, School Health Promotion Policy Guidelines and Rationale for School Health Promotion. The resources provided information and strategies that could be used to develop a wide range of school health promotion activities targeting a variety of school community groups including students (within and outside the classroom), parents, teachers, formal organizational supports for health and links with wider community. More detailed information concerning the content of each resource is available on request (McBride, 1998). The health coordinator or principal from all schools in the treatment group 2 category was telephoned 1 week after the mail-out of resources to indicate the number of schools that had received the documents. In all cases treatment group 2 schools had received the documents.

Measurement instrument procedure

The instrument used to assess changes in school health promotion for this study evolved from the formative phase of the WASH Project. The dependent variables were grouped into two categories. The first category pertained to school management factors that reflected school organizational support for health and drew on system theory related to school organizational change processes (Holder and Howard, 1992). In this case, the school as the system and change supportive of health promotion is achieved by influencing that system. The second category included factors that indicated the level of school health promotion activity. These health promotion variables were derived from Kolbe’s model of ‘School Health Promotion Components and Outcomes’ (Kolbe, 1986) which itemized eight broad categories for school health promotion activity (school health education, school physical education, school health, school nutrition and food service, school health services, school counselling services, school staff health promotion activities, and integrated school and community health promotion activities) and two additional components identified during the developmental phase of the WASH Project (McBride et al., 1999). Interviews were undertaken with the school principal and/or the health coordinator to complete the survey and responses were validated by the collection of school planning documents that related to measurements variables (e.g. school health budget, school development plan, health plan, canteen menu).

For the purposes of this study, measurement variables were incorporated into two scales, i.e. a school organizational scale and a health promotion scale. The development of the scale provided the opportunity to assess the strength of relationship between the measurement variables selected for each category. Internal consistency of the scales were based on baseline data and assessed using Chronbach’s $\alpha$.

School organizational scale

Prior to testing for internal consistency, eight items were identified for testing school organizational support (McBride et al., 1996). After applying assessment of scale reliability (Coakes and Steed, 1996) the following five-item scale evolved (Chronbach’s $\alpha = 0.76$):

- Health is included in formal school planning documents.*
- Health is a documented priority subject on formal school planning documents.*
- The school has a coordinator and/or committee to plan, implement and coordinate health promotion activities.
- ‘School’ time is allocated to the health coordinator and/or health committee to plan and implement health promoting activities.
- The school has an adequate health promotion budget.*
- The school has a formal health promotion strategic or development plan that is updated and reviewed regularly.

*Variables combined as one scale item.

Variables that were excluded from the school organizational scale during statistical analysis of internal consistency were:
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- The school has an active comprehensive school health promotion policy.
- The school health promotion budget is a separate cost centre.
- The school provides regular health in-service training to all staff.
- The school funds staff to attend health training that is external to the school.
- The school has an adequate base of health resources.

One variable from those excluded in the organizational scale (health in-service training for all staff) was subsequently incorporated as a potential health promotion scale item as it was deemed an important element in school health promotion by practitioners and key school-based informants (McBride et al., 1996).

Health promotion scale
Prior to testing for internal consistency, 11 items were identified for testing school health promotion activity (McBride et al., 1996). After applying assessment of scale reliability (Coakes and Steed, 1996), a nine-item scale evolved (Chronbach’s \( \alpha = 0.79 \)):

- Schools access of resources and expertise from community health agencies.
- Involvement of the local community in school health promotion activities.
- Providing parents with health educational opportunities.
- The number of parents actively involved in health promotion within the school.
- The provision of funding for health promotion by the parent organization.
- Providing health promotion activities for staff.
- The number of staff who actively support health promotion in the school.
- School fund-raising activities reflect health promotion emphasis.
- The school provides regular health in-service training to all staff.

Variables that were excluded from the health promotion scale during analysis of internal consistency were:

- Providing healthy foods in the school canteen—canteen policy.\(^4\)
- Providing healthy foods in the school canteen—canteen committee.\(^4\)
- Providing healthy foods in the school canteen—canteen manager actively supports and promotes healthy foods in the canteen.\(^4\)
- Providing healthy foods in the school canteen—regular training for canteen manager.\(^4\)
- An on-site smoking venue is provided for school staff.

Differing superscripts indicate combined variables.

The level of Chronbach’s \( \alpha \) attained for the school organizational scale (0.76) and the health promotion scale (0.79) are substantial for this type of behavioural scale (Botvin et al., 1990; Litwin, 1995).

Data analysis
Research hypotheses
The fundamental hypotheses of this study are based on the following questions:

- Do schools in each study group, all of which service a population with similar health needs, equally identify health as a priority area on their school development plan?
- Do schools in each study group provide equal organizational support and health promotion activity supportive of comprehensive school-based health promotion?
- Do schools that have identified health as a priority on their school development plan, equally plan and implement comprehensive health promotion activity for the school community?

Change was expected to occur in one direction (positive change) based on the intensity of intervention, thus the hypothesis can be best represented by the following equation:

\[
H_0 : \mu_1 = \mu_2 = \mu_3
\]
\[
H_1 : \mu_1 > \mu_2 > \mu_3
\]

Due to the low number of schools participating in the study, and upon examination of the frequency
distribution of the two primary dependent variables and the school organizational scale and health promotion scale, non-parametric analysis have been adopted as the appropriate analysis procedures (Shott, 1990; Woolson, 1987). As less powerful non-parametric tests were used to assess statistical significance, a significance value of $P = 0.05$ has been used to define level of statistical significance.

**Hypotheses 1 and 3**

$\chi^2$ tests were to be conducted for hypothesis 1; however, due to the small sample size, $\chi^2$ test assumptions were not met (Shott, 1990). Confidence intervals based on the exact binomial distribution were created to test for significant differences in the proportion of schools that identified health as a priority within their school development plan, within and across groups over time (Woolson, 1987). Significance was achieved when confidence intervals did not overlap.

**Hypothesis 2**

Hypothesis 2 required examination of changes in the organizational and health promotion scale within and between groups across time. To undertake this analysis a series of non-parametric procedures were used to determine statistical significance. Differences within groups across time were analysed using the Freidmans test (Coakes and Steed, 1996). If there was an overall statistically significant difference within a group across time the Wilcoxon signed-rank test was used to determine between which data collection point the difference occurred (Coakes and Steed, 1996). Differences between groups, at each point in time, were analysed using the Kruskal–Wallis test (Coakes and Steed, 1996). If there was an overall statistically significant difference between the three groups, the Mann–Whitney $U$-test was used to determine which groups differed and at which data collection point (Coakes and Steed, 1996).

**Results**

**Hypothesis 1**

Table I provides a summary of the number of schools with a health priority over the period of the study. Analysis indicated that at baseline (pre), at post1 and at post2, there was no significant association between treatment groups and health priority. In addition, there were no significant differences in the proportion of schools who identified health as a priority within each group across the three time points.

**Hypothesis 2**

**School organizational scale**

As a first step in the analysis of hypothesis 2, changes across time in school organizational scale scores were assessed within each treatment group. The high-intensity intervention group demonstrated a significant improvement across time (Freidman’s test, $P = 0.023$). This difference was only statistically significant between pre and post1 (Wilcoxon signed-rank test, $P = 0.008$). The observed improvement in school organizational score was sustained at post2 as there was not a significant decrease between post1 and post2 scores. Significant differences across time were not observed for either treatment group 2 (Freidman’s test, $P = 0.59$) or the comparison group (Freidman’s test, $P = 0.423$).

The second step in the analysis of hypothesis 2 was to assess differences between study groups related to school organizational scale scores. At baseline, there was no significant difference between study groups (Kruskal–Wallis test, $P = 0.835$). At post1, there was a significant difference in the mean rank organizational score between groups ($P = 0.007$). This difference occurred between treatment group 1 and treatment group 2 (Mann–Whitney test, $P = 0.001$), and between treatment group 1 and the comparison group ($P = 0.046$). At post2, the between group differences

### Table I. Number of study schools with a health priority

<table>
<thead>
<tr>
<th></th>
<th>Treatment group 1 ($n = 11$)</th>
<th>Treatment group 2 ($n = 11$)</th>
<th>Comparison ($n = 11$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>7</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Post1</td>
<td>7</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Post2</td>
<td>5</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>
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documented for post1 analysis were maintained and improved. The Mann–Whitney test revealed that the high-intensity intervention group had a significantly higher mean rank value for organization than was observed in the less intensive intervention group and the comparison group ($P = 0.001$ and $P = 0.046$, respectively).

Health promotion scale

The procedures used to investigate differences in school organization were also applied to the analysis of health promotion as the scale of interest. As a first step, across time changes were assessed within each treatment group for the health promotion scale. This analysis revealed a significant difference in health promotion across time for treatment group 1 (Freidman’s test, $P = 0.039$). This difference occurred between pre and post1 (Wilcoxon signed-rank test, $P = 0.018$), and pre and post2 (Wilcoxon signed-rank test, $P = 0.036$). Neither the less intensive intervention group nor the comparison group recorded a significant within group change across time.

The second step in the analysis of hypothesis 2 in relation to the health promotion scale was to assess differences between study groups. At baseline, there was no statistically significant difference between study groups (Kruskal–Wallis test, $P = 0.07$). Similarly, at post1, there was no significant difference between study groups (Kruskal–Wallis test, $P = 0.121$). However, at post2, there was a statistically significant difference in mean rank health promotion scores between study groups (Kruskal–Wallis test, $P = 0.006$). Mann–Whitney tests were used to further examine these differences. Differences were observed between the high-intensity intervention group and the low-intensity intervention group ($P = 0.010$), and the high-intensity intervention group and the comparison group ($P = 0.003$). No difference was recorded between the low-intensity intervention group and the comparison group ($P = 0.921$). These results suggest that the less intensive intervention proved to be no more effective than receiving no intervention, whereas the high-intensity intervention seemed to increase and maintain high levels of health promotion.

<table>
<thead>
<tr>
<th>Table II. Number of study schools with a strategic plan for health</th>
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</thead>
<tbody>
<tr>
<td>Treatment group 1</td>
</tr>
<tr>
<td>$1$ ($n = 11$)</td>
</tr>
<tr>
<td>Pre</td>
</tr>
<tr>
<td>Post1</td>
</tr>
<tr>
<td>Post2</td>
</tr>
</tbody>
</table>

Parentheses indicates the number of schools that had a implementation plan, rather than a more formal strategic plan for health. Only those schools that had a formal strategic plan for health were included in analysis of hypothesis 3.

<table>
<thead>
<tr>
<th>Table III. Scope and depth of strategic plan activities</th>
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<tbody>
<tr>
<td>Treatment group 1</td>
</tr>
<tr>
<td>($n = 11$)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Post1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 3

Analysis indicated there was no significant difference within any treatment groups across time. Similarly, analysis showed that at baseline (pre), post1 and post2 there was no significant difference in the proportion of schools with a strategic plan for health, within each group across the three time points. Table II provides a summary of schools in each treatment group, that had a strategic plan for health at pre, post1 and post2.

Table III provides an overview of the comprehensiveness of strategic planning for health by treatment/comparison groups, across time. The strategic plan for each study school that had health/health promotion as a priority area was evaluated as to the scope (number of potential health promotion categories that have been included in the plan) and depth (number of times a category has been targeted for an activity) of health promotion planning as a measure of health promotion activity. Assessment
was based on the following nine broad categories (Kolbe, 1986; McBride et al., 1998):

- Classroom-based health education.
- Physical education.
- School environment.
- Nutrition and food services.
- Counselling services.
- Staff health promotion.
- Integrated school and community health promotion activities.
- Parental involvement.
- School health management and support.

At baseline, treatment group 1 schools demonstrated a similar level of planning for health to schools in both treatment group 2 and the comparison group. Treatment group 2 and the comparison group showed little variation in the scope or depth of their health planning across the study period. However, after receiving the high-intensity intervention (post1 and post2), treatment group 1 schools demonstrated a slightly higher scope and higher depth in their health promotion planning than the other schools in the study.

To analyse the differences in planning depth data has been collapsed into two groups. The first group combined plans from schools in the high-intensity intervention subsequent to the intervention (post1 and post2). The second category is a combination of plans from the low-intensity and comparison group schools. Data has been collapsed based on the above results which indicate change in planning level for high-intensity intervention schools and little change in low-intensity intervention and comparison schools. Table IV illustrates the number of activities (depth) per category in the two collapsed groups.

**Scope**

By documenting the difference in scope, Table III provides some indication of the number of categories targeted for health promotion activity by various treatment conditions. Table IV, however, provides a more detailed analysis of scope by identifying the categories in which activity occurred. Table IV indicates that although there are only minor differences in the number or type of categories included in strategic planning between treatment groups, the one category commonly missing from all strategic plans was counselling.

**Depth**

Table IV indicates that two of the nine categories demonstrated no difference in depth of activity between collapsed study groups. Treatment group 1 schools (post1, post2), however, demonstrated a high depth of activity in six of the nine categories, while the combined comparison/treatment group demonstrated a higher level of activity in two of the nine categories.

In addition, Table IV illustrates a clear overall difference in the number of activities undertaken per category between treatment group 1 schools and treatment group 2/comparison schools. After the high-intensity intervention, treatment group 1 schools incorporated more health-related activities into their strategic plans. Qualitative analysis of strategic plans indicates that treatment group 1 schools provided a more diverse range of health promotion activities. For example, in the school environment category, treatment group 1 schools incorporated an extensive range of positive whole school health promotion activities involving the extended school community, such as ‘fitness morning and school breakfast’, ‘healthy house competition’ and ‘healthy school recipe book and tasting demonstration’, as opposed to the more disciplinary and negative whole school activities documented on other strategic plans, e.g. defining and maintaining eating areas in the school.

Notably, after the intervention, treatment group 1 schools demonstrated a greater number and diversity of activities within the same planning period as the fewer and more administration oriented activities in the treatment group 2/comparison schools.

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**Discussion**

**Hypothesis 1**

*Do schools in each study group, all of which service a population with similar health needs,*
### Table IV. Average number of activities per strategic plan category

<table>
<thead>
<tr>
<th>Activity category</th>
<th>Group 1 (Treatment group 1)</th>
<th>Group 2 (Treatment groups 2 and 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom-based health education&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.7</td>
<td>0.6</td>
</tr>
<tr>
<td>Physical education</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>School environment&lt;sup&gt;c&lt;/sup&gt; conditions/structures&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.2</td>
<td>2.6</td>
</tr>
<tr>
<td>whole school events&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.5</td>
<td>3.4</td>
</tr>
<tr>
<td>School health management and support&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.8</td>
<td>2.6</td>
</tr>
<tr>
<td>Nutrition and food services&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.6</td>
<td>0.4</td>
</tr>
<tr>
<td>Counselling services</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Staff health promotion&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Integrated school and community health promotion activities&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Parental involvement&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.8</td>
<td>1.4</td>
</tr>
</tbody>
</table>

<sup>a</sup>Indicates categories in which treatment group 1 schools (at post1 and post2) had a higher number of activities.

<sup>b</sup>Indicates categories in which treatment group 2/comparison schools had a higher number of activities.

<sup>c</sup>The school environment category was divided into two sections. During analysis of plans it became clear that two types of activities were incorporated into this section. The first related to environmental safety and supports for maintaining appropriate structures and conditions in the school, e.g. adequate shade areas. The second area of planning related to activities that were school health promotion events involving the whole school community. These planning events were the most common type of health activity planned by both intervention and comparison schools.

At baseline, the number of schools with a health priority in the low-intensity intervention group was only slightly lower than schools in the high-intensity intervention group. This cannot be explained by a similar negotiation/pre-test lag-time as suggested for treatment group 1 schools. The relatively high number of low-intensity intervention schools with a formal health priority at baseline may be partially explained by the health orientation of personnel within these schools. Two schools in the second treatment group had health and administrative staff who were also committee members of the Australian Council for Health, Physical Education and Recreation (WA Branch), a professional association for teachers with a health interest. These personnel had intimate knowledge of the WASH Project. One person was involved in writing the original WASH Project funding proposal and sat on the WASH Project management committee for a number of years. Given the small number of schools in the study, the unusually high level of health expertise in two low-intensity intervention schools may have contributed to the
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relatively high number of schools with a health priority in this treatment group at baseline. In contrast, the number of comparison schools with health as a priority at baseline was relatively lower than either intervention group.

Over the period of the study, both the high- and the low-intensity intervention groups showed a decline in the number of schools with a health priority. In the high-intensity intervention schools, this decline did not occur until 1 year after the intervention finished, suggesting a possible maintenance effect for health priority during the period of the intervention. This trend is perhaps not surprising given the immediacy of the schools involvement in the WASH Project at post1. In addition, at post2, treatment group 1 schools recorded a lower fall in the number of schools with a health priority than observed in treatment group 1 schools. This lower drop-off rate may be partially explained by the continued influence of the high-intensity intervention over time.

Although treatment group 2 schools received a low-intensity intervention this seems to have had little influence in adoption or maintenance of a health priority over time. Schools receiving the low-intensity intervention showed a gradual decrease in health priority over time, reflective of a normal planning cycle. Interestingly, comparison schools showed quite a bit of variation in health priority during the period of the study. Initially, a relatively low number of comparison schools identified health as a priority \((n = 4)\); however, this increased to the same level as treatment group 1 schools during post1 \((n = 7)\) with a small drop off at post2 \((n = 6)\). The increase may be partially explained by the testing effect of the study (Windsor et al., 1994) or by a shorter planning cycle than schools in the other treatment groups.

The low number of schools in the study and the variability demonstrated by comparison schools related to health priority across time limited the possibility of achieving statistical significance in this instance. There were, however, some changes over time that although not of statistical significance may be of practical significance. In particular, there was some maintenance effect demonstrated in schools receiving the high-intensity intervention and limited change in schools participating in the low-intensity intervention. This would suggest that a higher level of targeted resources, training and expertise provided over a period of time, in interested schools, may be more effective in initiating and maintaining health priorities in schools than an intervention providing mail-out resources only, with no follow-up or additional support, to schools with variable interest in health. Future studies involving larger groups of schools and a mix of intervention strategies will be better able to clarify the threshold of external input required to create and maintain school determined health priorities.

**Hypothesis 2**

*Do schools in each study group provide equal organizational support and health promotion activity supportive of comprehensive school-based health promotion?*

In terms of the organizational scale, the high-intensity intervention group was the only study group that demonstrated significant improvement in scores across the period of the study. Importantly, this change occurred immediately after the intervention period and was maintained for up to one year after the intervention. In addition, the high-intensity intervention schools were significantly different to both the low-intensity and the comparison groups immediately after the intervention at post1. This difference was maintained 1 year after the conclusion of the intervention at post2. Although these results do not support the full alternative hypothesis for hypothesis 2, as it applies to the organizational scale, they do provide supportive evidence that a high-intensity intervention such as the WASH Project, which provides teacher release for training and planning, can act as a catalyst for school-based organizational support for health promotion. The results indicate that school organizational change can occur within the period of the intervention. This suggests a relatively short turn-around for change. Conversely, an intervention that only provides a series of mail-out resources is less effective in creating organiza-
tional change supportive of health promotion as illustrated in post2 results.

As with the organizational scale, the high-intensity intervention group was the only study group that demonstrated a significant improvement across the period of the study in the health promotion scale. However, this difference did not occur until 12 months after the conclusion of the intervention at post2. This delay in significant change indicates that a latency period may be required for schools to undertake broad ranging health promotion activity. This result suggests that organizational change, supportive of health promotion, is a precursor to the implementation of health promotion activity. Between group results support this notion as the only significant difference that occurred between groups occurred 12 months after the intervention at post2. These differences occurred between the high-intensity intervention group and the low-intensity intervention group, and the high-intensity intervention group and the comparison group.

The results for hypotheses two suggest that a high level of ‘top-down’ interaction and resource support is required to achieve comprehensive school health promotion change in interested schools. The provision of such support is an expensive process. The expenditure for the WASH Project intervention was approximately AU$6600 per school (McBride et al., 1996). If such a high level of interaction is required to achieve significant change in interested schools, then funding is a major issue that needs to be considered. The greatest areas of expenditure for the high-intensity intervention was in the payment of teacher release for training and planning time, and in employing a project officer. Alternative interventions that are of medium intensity need to be explored. Although a dose–response relationship was not recognizable through the results of this study it is possible that an intervention that comes part way between the high- and low-intensity interventions may be able to achieve a threshold level of intervention necessary to achieve the desired change. Future studies should explore the threshold level of external support required to create and maintain comprehensive school health promotion change. A medium-intensity intervention based on key factors drawn from previous studies may be a useful initial progression.

**Hypothesis 3**

*Do schools that have identified health as a priority on their school development plan, equally plan and implement comprehensive health promotion activity for the school community?*

The first phase of statistical analysis for hypothesis 3 indicated that there was no significant difference in the proportion of schools that had a strategic plan for health, between or within groups across time. The results for this component of hypothesis 3 are identical to the results for hypothesis 1, as schools which have identified health as a priority on their school development plan are required by the Education Department of Western Australia to have a formal strategic plan for health. Thus, the trends and influences as discussed for hypothesis 1 equally apply to hypothesis 3. In summary, these factors include selection bias of treatment group 1 schools, negotiation lag-time required in the high-intensity intervention; high level health orientation of staff from two low-intensity intervention school (given the low sample size), immediacy effect in the high-intensity intervention schools, normal planning cycle influences or unidentified background effects on comparison group schools. Although no statistical significance was demonstrated, practical significance cannot be excluded given the potential maintenance effect of the high-intensity intervention.

The second component of analysis for hypothesis 3 involved both quantitative (frequencies) and qualitative analysis of health strategic plans. This analysis indicated that after the high-intensity intervention, treatment group 1 schools were more comprehensive in their planning for health promotion activity than either the low-intensity intervention schools or the comparison schools. High-intensity intervention schools demonstrated a slightly higher level of scope and a noticeably higher level of depth in their strategic planning. In addition, after the intervention, the majority of high-intensity intervention schools included a
more diverse range of health promotion activities involving the whole school community. This more comprehensive level of planning was maintained 1 year after the conclusion of the intervention. In contrast, there was little difference demonstrated between low-intensity and comparison school planning, during all phases of the study.

One category area, counselling, was not considered in planning by any of the study groups during the period of the study. This lack of planning for the counselling category may have been influenced by a number of factors. Firstly, the high-intensity WASH Project intervention did not overtly identify or target this category in its training or subsequent interactions with schools. Low-intensity intervention schools did, however, receive one resource which had a small section covering counselling issues. Secondly, school counsellors are generally in the school on a part-time basis only and have multiple responsibilities. Thirdly, the funding and administration of counselling services (school nurse/school psychologist) provided in schools is operated through the health sector and as such schools may feel that this is beyond their control and core business. Current health sector services in schools tend to have a treatment orientation and alternative counselling supports such as quit programs for students (as opposed to disciplinary action) and staff wanting to give up smoking should be explored in future interventions.

Two category areas, school environment (conditions/structures) and school health management and support, were both targeted for activity by study schools; however, high-intensity intervention schools provided less activity than low-intensity and comparison schools. The reasons for this difference in activity level are not clear but may include a combination of the following.

- High-intensity intervention schools were already attuned to health issues and had previously incorporated aspects from both categories into their organizational structure, thereby requiring little further planning.
- High-intensity intervention schools attained some health management and support directly from their involvement in the intervention therefore requiring less attention during subsequent planning and implementation phases.

The high-intensity intervention provided utility knowledge about a broader range of health promotion activities to which schools could direct their efforts.

- Schools in the low-intensity intervention and comparison groups had less prior organizational support and planning for health, and required more attention to management and structural strategies prior to undertaking further activity-based health promotion planning.
- Low-intensity and comparison schools did not have the utility knowledge, planning time or motivated staff to undertake more extensive health promotion activity and thus focused on school environment (conditions/structures) and management issues.

The elements encompassed by the school health management and support category are largely included in the items of the organizational scale. Previous studies have identified organizational support as a crucial aspect leading to school planning and activity and as such they are an important basis for change (Parcel et al., 1987; McBride et al., 1996). Given the high-intensity intervention groups significant results for organizational scale in the previous hypotheses, it seems that management and support elements have occurred prior to strategic planning and may be documented on alternative development planning documents other than the strategic plan. If this is the case, then the results documented in the analysis of hypothesis 3 may misrepresent high-intensity intervention schools current management support for school health promotion.

The practical significance of hypothesis 3 findings are important. The results suggest that a high-intensity intervention, such as the WASH Project, which provides training to a critical mass of school community members from each school, ongoing access to an expert in the field, as well as dedicated planning time, is able to increase the comprehensiveness and quality of health strategic planning.
by schools. In particular, planning is increased in the following category areas: regular whole school health promotion events, nutrition and food services, staff health promotion activities, and integrated school and community health promotion activities and parental involvement.

The more comprehensive health promotion planning and subsequent activity level produced by a high-intensity intervention, such as the WASH Project, is crucial in determining the effectiveness of school health promotion programs. The fundamental basis for the success of schools as settings for health promotion is based on the premise of comprehensively effecting a number of the influences on children’s health choices, and providing models and reinforcement for children’s positive health behaviours. Thus comprehensive planning and implementation of health promotion activities by schools is crucial if this aim is to be achieved.

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References


tobacco free school project 1986–89. In Burston, D. and
Jamrozik, K., (eds), The Global War. Organizing Committee
of the 7th World Congress on Tobacco and Health, Perth.
National Health Strategy Unit (1992) Enough to Make You
the gap between theory and practice. Health Promotion
Nutbeam, D., Wise, M., Bauman, A., Harris, E. and Leeder, S.
(1993) Goals and Targets for Australia’s Health in the Year
2000 and Beyond. Report prepared for the Commonwealth
Department of Health, Housing and Community Services.
Australian Government Printing Services, Canberra.
Parcel, G. S., Simons-Morton, B. G., O’Hara, N. M.,
promotion of healthful diet and exercise behaviour: and
integration of organizational change and social learning
Pigg, R. M. (1989) The contribution of school health programs
to the broader goals of public health: the American
Resnicow, K., Cross, D. and Wynder, E. (1991) The role of
comprehensive school-based interventions. The results of
four Know Your Body studies. Reprinted from Hyperlipidemia in Children and the Development of
Atherosclerosis. Annals of the New York Academy of
Sciences, 623.

questions regarding comprehensive school health promotion.
Journal of School Health, 63, 171–175.
of School Health, 52, 1081: 14.
H. M., Patrick, K., Parcel, G. S. and Igoe, J. B. (eds),
Principles and Practice of School Health. Third Party,
Heart Foundation (Western Australia) approach. Journal of
School Health, 63, 136–140.
Shott, S. (1990) Statistics for Health Professionals. Saunders,
Philadelphia, PA.
Health Education: Suggested Guidelines for Action. WHO,
Geneva.
Evaluation of Health Promotion, Health Education and
Disease Prevention Programs. Mayfield, Mountain View, CA.
Woolson, R. S. (1987) Statistical Methods for the Analysis of
WHO (1996a) School Health Promotion. Report on the
Workshop on School Health Promotion. Series 1. WHO,
Western Pacific.
WHO (1996b) School Health Promotion. Report on the
Workshop on School Health Promotion. Series 4. WHO,
Western Pacific.

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