

4 Preventing cardiovascular disease

4.1 Background

Cardiovascular disease prevalence and trends

CVD is the leading cause of death in Australia, accounting for 39 per cent of all deaths in 2000. Age-specific death rates for CVD increase dramatically with age, with the majority of deaths occurring among people aged 50 years or over. After reaching a peak around the middle of the 20th century, age-standardised death rates for CVD have declined steadily for both men and women. Reductions in CVD morbidity and mortality have been attributed to a combination of behavioural changes and medical interventions. While incidence and mortality rates have declined, however, prevalence rates have increased (to 21 per cent of the population in 1995), partly due to medical advances that have increased the survival rate among people with CVD (Australian Bureau of Statistics 2002a).

Costs of cardiovascular disease

The overall burden of disease attributable to CVD in Australia—accounting for both premature mortality and disability—was an estimated 22 per cent of the total disease burden in 1996 (Mathers et al. 1999). The health and economic costs associated with CVD are greater than any other disease, accounting for \$3.7 billion (or 12 per cent) of total health costs in 1993–94 (AIHW 2000).

Preventing cardiovascular disease

A number of important CVD risk factors have been identified. These include socioenvironmental risk factors (such as poor material circumstances) (Raphael 2003), psychosocial risk factors (such as depression and lack of social support) (Bunker et al. 2003), behavioural risk factors (such as smoking, physical inactivity and dietary fat intake) (AIHW 2001) and physiological risk factors (such as high cholesterol, hypertension and obesity) (AIHW 2001). A recent evidence based review by the Joint World Health Organisation/Food and Agriculture Organisation Expert Consultation on Diet, Nutrition and the Prevention of Chronic Disease concluded that dietary risk factors for CVD include a high intake of saturated fatty acids, trans fatty acids, sodium, and alcohol (in excess). Protective dietary components include fish and fish oils, potassium, fruits and vegetables, low to moderate alcohol intake, and dietary fibre and wholegrain cereals (World Health Organisation 2003).

Social inequalities and cardiovascular disease

In 1995, 82 per cent of women in the lowest socioeconomic group had a CVD risk factor (tobacco smoking, high blood pressure, overweight or obesity, physical inactivity) compared with 69 per cent in the highest group. Almost 13 per cent of women in the lowest socioeconomic group had three or more risk factors, compared with seven per cent of women in the highest group (AIHW 2001).

Men in the lowest socioeconomic group were twice as likely to have three or more risk factors than men in the highest group (18 per cent and nine per cent respectively) (AIHW 2001).

Consistent with their risk factor data, Voss and Begg. (1999) reported substantial socioeconomic status differences in premature mortality from cardiovascular disease among Victorian men and women.

No comparable multiple risk factor data are available for Indigenous Australians, but they are more likely than other Australians to be obese, physically inactive, and to smoke (AIHW 2001). Indigenous Australians have higher mortality rates for cardiovascular disease than the general population (AIHW 2002a).

Prevalence rates of at least one CVD risk factor are slightly higher among men and women in rural and remote areas compared with urban areas, but the differences are not statistically significant (AIHW 2001).

Overview of interventions reviewed

Interventions to reduce cardiovascular disease risk have addressed one or more risk factors using a range of strategies in a number of settings. The interventions reviewed in this section are those that:

- address multiple CVD risk factors
- use multiple strategies, with adult populations
- focus on primary prevention (that is, a focus on people with no history of CVD)
- employ health promotion strategies (that is, not surgical and drug therapy prevention)
- have a population or group focus rather than an individual counselling focus.

This review needs to be read in conjunction with the complementary reviews of interventions focusing on physical activity, nutrition, smoking, healthy weight and socioenvironmental and psychosocial factors.

Over the past three decades, interventions to promote heart health have included:

- programs in health care settings
- community based programs in workplaces and other community settings
- large, multifaceted, community based trials aimed at primary prevention at the population level
- public education incorporating widespread, largely uncoordinated information, education and advice disseminated by government departments and nongovernment organisations.

While all these initiatives are likely to have contributed to the declining incidence of CVD over the past three decades, only the large demonstration trials and smaller scale interventions in health care settings and workplaces have been subjected to rigorous evaluation. Consequently, the evidence base for assessing the effectiveness of community based heart health initiatives is limited to these interventions and probably excludes effective, but unevaluated community based interventions and diffuse public education strategies.

This section summarises the evidence for the effectiveness of:

- interventions in health care settings
- worksite interventions
- multifaceted community based interventions
- policy initiatives.

4.2 Interventions in health care settings

Intervention description

Multiple risk factor interventions (stopping smoking, exercising, following dietary advice, controlling weight, taking anti-hypertensive drugs and/or taking cholesterol lowering drugs) used for the primary prevention of coronary heart disease. Adults attending primary care settings were counselled (individually or in groups) by dietitians, nurses, general practitioners and/or other health professionals about implementing lifestyle changes. Interventions varied from a single consultation to intensive lifestyle advice.

Population group/setting

The reviewed interventions targeted adults attending primary care settings. Studies included both high risk individuals and the general population. One review included two large US trials among persons of colour and low socioeconomic status.

Effectiveness

In health care settings, multifaceted interventions targeting high risk individuals were generally effective, but those targeting the general population were less effective, with smaller effect sizes and greater variability among studies. General practitioner based lifestyle advice programs have a modest and variable effect on lifestyle change (smoking, drinking, diet and exercise). There is some debate about the practical significance of small improvements in CVD risk factors through interventions in health care settings. Small effects need to be assessed in the context of the potential for wide population reach, particularly the potential to reach disadvantaged groups. Implementation factors are also likely to be important (see below).

Implementation issues

- Dietary interventions can be successful among traditionally difficult-to-reach groups (persons of colour and low socioeconomic status) if the interventions are culturally tailored and specifically designed for these groups.
- One review reported several barriers to general practitioners providing health promotion advice to their patients, including limited time, remuneration and doctors' common perception that providing lifestyle advice is not effective in changing patient behaviour.

Comments

- For the modest changes observed to translate into a useful public health effect, a greater proportion of primary health care providers need to offer lifestyle advice routinely and repeatedly.
- Alternatively, practitioners should direct their efforts towards high risk groups for whom the potential for substantial change may be greater.

References

Yu-Poth et al. (1999) (meta-analysis); Ketola et al. (2000) (meta - analysis); Ebrahim and Davey Smith (2003) (systematic review and meta-analysis); Wilcox et al (2001) (systematic review); Ashenden et al. (1997) (systematic review).

4.3 Workplace interventions

Intervention description

Workplace health promotion programs have addressed CVD screening and risk assessment, weight loss, healthy eating, alcohol abuse and healthy alliances. Interventions have included awareness raising, lifestyle change (via skills acquisition workshops and counselling) and environmental support programs (for example, low fat foods in workplace canteens).

Population group/setting

The reviewed interventions targeted adults in workplaces. Most trials did not specifically target minority population groups.

Effectiveness

Comprehensive programs combining screening and risk assessment with educational programs and/or environmental changes have been effective, but this conclusion was based on only a small number of sound studies. There is no conclusive evidence of the effectiveness of social support provided by peers or group leaders as part of broad educational interventions. Incorporating a skill development component produced variable results. However, combining skills training with social support in interventions targeting a specific risk behaviour was more likely to be effective than using skills training as part of a broad, complex intervention.

Implementation issues

- Top management should visibly and enthusiastically support, and be involved in, the intervention.
- Employees at all organisational levels should be involved in the planning, implementation and activities of the intervention.
- Interventions should be tailored to the characteristics and needs of the recipients.
- Optimal use of local resources (human, physical and organisational) should be made in organising and implementing the intervention.
- Evaluation should be included as an integral part of any new intervention program. It should include a range of outcome and process measures.

Comments

- It is relatively easy to recruit eager employees into wellness programs if programs are provided onsite, but engaging the reluctant employees requires one-to-one approaches.
- Overall, the relatively low participation rates are a concern and indicate that these programs reach only certain population groups.

Reference

Peersman et al. (1998) (systematic review).

4.4 Multifaceted community based interventions

Intervention description

Community based interventions involve health professionals and/or health agencies defining the health problem, developing strategies to remedy the problem, involving local community members and groups in implementing those strategies and working to transfer major responsibility for ongoing programs to local community members and groups (Labonte 1993). Strategies commonly include combinations of mass media, educational materials, workshops/educational sessions, blood pressure and cholesterol screening, individual counselling, self-help support groups, contests and television shows/videos. Targeted outcomes include health risk behaviours (smoking and low physical activity), physical health status (systolic and diastolic blood pressure, blood cholesterol, body mass index, aggregated CVD risk scores and CVD mortality rates) and knowledge. Projects typically run for five to six years.

Population group/setting

The reviewed interventions targeted adults in community settings, worksites and health care settings. Most targeted all community members, although some focused on high risk individuals. Trials were conducted in north America, Europe and Israel, but US trials predominated. Most trials did not specifically target minority population groups.

Effectiveness

While some of the early community based heart health programs (such as the North Karelia project and the Stanford Three Communities Study) were effective in reducing CVD risk factors at the population level, subsequent large intervention trials had smaller, more variable impacts. This lack of success indicates that while specific programs conducted within these large interventions were often effective (particularly for motivated high risk individuals), they generally failed to produce substantial change at the population level over and above improvements occurring in the general population. Initial program impacts tend to diminish over time. It is likely that these projects have indirectly contributed to the improving population trends, but not in a way that can be rigorously measured. Measurable change is more likely when high risk individuals are targeted.

Implementation issues

- A review of the effectiveness of coalitions in heart health promotion could not conclude whether coalitions lead to improved heart health outcomes.
- While it is generally widely recommended that interventions be based on theoretical models (such as theories of behaviour change), there is little evidence that theory based interventions are more effective than approaches that have no formal theoretical base.

Comments

- Wide variability in the impacts of different interventions poses important questions about the contextual, programmatic and participant characteristics, which clearly have a marked impact on the effectiveness of different interventions.

- The success of the North Karelia project in Finland, for example, might have been partly due to the initial high levels of CVD risk factors and the generally small rural communities involved in the project.

In summary:

- Well planned, well implemented, small scale community programs can be effective but tend to attract high risk or highly motivated individuals. These programs are appropriate for such individuals.
- A large number of such programs would be needed to have an impact on the prevalence of CVD risk factors at a wider community level.
- Practitioners need to carefully define the level at which they expect to have an impact (for example, a town or local government area), then implement sufficient, multifaceted, sustained interventions (that include social and environmental change as well as individual behaviour change) in cooperation with partner organisations.

References

Dobbins and Beyers (1999) (systematic review); Winkleby et al. (1997) (joint analysis of three trials); Sellers et al. (1997) (meta-analysis); Kuhn et al. (1999) (systematic review).

4.5 Policy initiatives

Murray et al. (2003) assessed the cost-effectiveness of nonpersonal interventions (for example, salt reduction legislation) and personal interventions (for example, individual treatment for high cholesterol) to reduce CVD risk. They estimated that all 17 interventions were cost-effective according to the World Health Organisation Commission on Macroeconomics and Health criterion (which defines cost-effective interventions as those that gain each year of healthy life at a cost of less than three times gross domestic product per person). The authors also found that the nonpersonal interventions, while less effective than the personal interventions (in terms of the number of disability adjusted life years averted), were more cost-effective. On this basis, they recommended first introducing nonpersonal interventions, although they also noted that 'their very nature makes reliable assessment of effects challenging' (Murray et al. 2003).

The potential role for practitioners in policy change and implementation is twofold. At the macro level, advocacy for the development of national or state policies that promote health is a key but generally underused health promotion strategy (Nutbeam 1998). At the more local level, health promotion practitioners can both advocate for, and become directly involved in, the development and implementation of local policy in workplaces, local government and other community settings.

Additional policy and nonpersonal interventions directed at specific CVD risk factors are discussed in the reviews of physical activity, nutrition, obesity, smoking, and socioenvironmental and psychosocial factors.

Reference

Murray et al. (2003) (systematic review of cost-effectiveness).

4.6 Future directions for the prevention of cardiovascular disease

Sellers et al. (1997) described three generations of community heart health programs, with the first generation of programs comprising the Finnish North Karelia project, the Stanford Three Communities Study and the World Health Organisation initiated Comprehensive Cardiovascular Community Control Program in the early 1970s. The success of many of these early programs led to a second generation of major trials in the 1980s that incorporated rigorous evaluations. These second generation programs—which include the Stanford Five City Project, the Minnesota Heart Health Program and the Pawtucket Heart Health Program—produced more variable and generally less favourable outcomes. Sellers et al. (1997) described the more recent ‘third generation’ of CVD community programs as those working with hard-to-reach population subgroups. Wilcox et al. (2001) reviewed some of these more recent programs within health care settings.

It is recommended that a ‘fourth generation’ of CVD community programs will:

- continue to develop programs more appropriate for poor, minority, low income and other disadvantaged groups
- address newly identified psychosocial and socioenvironmental determinants of CVD, such as depression, lack of social support and social isolation, material and socioeconomic inequalities (see the review of socioenvironmental and psychosocial interventions)
- incorporate the fiscal, legislative, policy and environmental strategies that most reviewers recommend as potentially very cost-effective interventions, but that have not yet been widely implemented in areas other than tobacco control (see the reviews of food and nutrition interventions, physical activity interventions and healthy weight promotion interventions).

4.7 Resources

- The National Heart Foundation of Australia provides a range of resources for promoting heart health. (<http://www.heartfoundation.com.au/>)
- The Health Education and Promotion Scheme (HEAPS) is a searchable database listing a wide range of Australian and New Zealand health promotion projects. The database contains over 6000 entries including programs and resources in a number of health promotion areas (including heart health) for: Indigenous Australians, rural and regional Australia, youth, ethnic communities, women’s health and general practice. The electronic database is available online through libraries and health organisations.
- Also refer to programs and resources listed in chapters covering individual risk factors (chapters 5 to 9).