

Management of Cardiovascular Disease in Primary Care

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Abstract: Cardiovascular disease (CVD) is the leading around the world cause of death and represents a substantial expense problem for healthcare services. The occurrence of CVD is mostly discussed by the association of hazard aspects such as smoking, weight problems, high cholesterol and hypertension. In conclusion, Multifactorial community interventions improve cardiovascular threat aspects and have a little however potentially important result on mortality. When they are brought out at a high level of intensity, these interventions appear to be more effective in the at-risk population.

This review attempts to examine the effectiveness of multifactorial interventions carried out in the community setting to decrease cardiovascular threat in healthy patients.

Keywords: Cardiovascular disease (CVD), hazard aspects.

1. INTRODUCTION

Heart disease (CVD) is the leading worldwide cause of death and represents a considerable cost problem for healthcare services ^(1,2). The incidence of CVD is largely discussed by the association of threat aspects such as cigarette smoking, weight problems, high cholesterol and hypertension ⁽³⁾. Improvements in the danger elements connected with CVD through promotion of a healthy lifestyle are a logical method of preventing the advancement of CVD ^(4,5).

Population-based techniques for CVD prevention ought to consist of neighborhood activities ⁽⁶⁾ that customize private lifestyles and behaviors ^(7,8), counselling and inspirational interventions ⁽⁹⁾. Dietary intervention, light-to-moderate exercise and cigarette smoking cessation relate to minimized worths of CVD threat such as diastolic blood pressure, serum cholesterol and triglyceride levels in patients with diabetes type II ⁽¹⁰⁾, high blood pressure ⁽¹¹⁾ and coronary heart problem ⁽¹²⁾, and also are suggested as main avoidance of heart disease and stroke ⁽¹³⁾.

Systematic reviews have examined the effectiveness of interventions simultaneously targeting multiple danger factors carried out in the community setting as a primary prevention technique to reduce cardiovascular risk. Nevertheless, the heterogeneity of the studies' styles, danger aspects included and conclusions reached make it tough to determine the effectiveness of these interventions and how to apply these techniques. For that reason, the goal of this evaluation is to sum up and seriously assess the evidence supplied by the organized reviews, evaluating the multifactorial interventions performed in community settings as main prevention strategy to lower cardiovascular risk in CVD-free adults and show these as a comprehensive picture of the current proof concerning this concern.

2. METHODOLOGY

Systematic review of the MEDLINE (via PubMed), Web of Science and Cochrane Library databases from January 1980 to January 2014. Identified for inclusion were systematic reviews of clinical trials that included multifactorial interventions carried out in primary care or community settings, targeting more than one cardiovascular risk factor, and implementing more than one type of intervention. The methodological quality of the included articles was evaluated using the AMSTAR tool.

3. RESULTS AND DISCUSSION

The selection process retrieved 75 potentially relevant references. After reading the title and abstract of the 50 records retrieved, and having removed duplicates, 11 articles were selected for full-text review. Finally, seven studies were selected for systematic review in the present study. A total of eight studies were included in this systematic review all published between 1997 and 2011.

The CVD risk factors were, diastolic and systolic blood pressure measurements which were included in all the articles; total cholesterol was included in seven studies^(14,15,16,17,18,19, 20); smoking was included in six studies^(21,22, 23,24, 19,20), and body mass in four^(15,16,17,24). Other risk factors included were changes in alcohol use⁽²²⁾; fats, fruits and vegetables intake^(17,24); and physical activity^(22,17,24).

Interventions characteristics:

The studies varied in the techniques used in the interventions (Table 2). These included individualized sessions based on risk levels of the patients, in which was assessed the following: patient's behavior change, the goals to reduce risk and improved cardiovascular health, and how to develop a personalized plan to achieve it^(21,22,23,19,20); screening sessions, with an educational presentation adapted to the level of heart-healthy^(23,19,20); use of written or audiovisual educational materials, with exchange process information and audio visual images about the risks of developing cardiovascular disease or those associated with corresponding medical intervention, facilitating a better understanding of the patients and better decision-making about their health^(21,16,24,19,20); instructions on cognitive relaxation techniques⁽²⁰⁾; promoting a healthy diet, with strategies including national and global advice for the regime and physical activity, calorie restrictions, decrease of sodium intake or workshops^(21,17,19,20); self-administered food frequency questionnaires, studied reliability of intake data dietary^(22,20); follow-up e-mail and telephone contact^(24, 20); support sessions, based on counselling or psychological interventions, particularly those using behavioral strategies^(21,16,23,24,19); use of mass media⁽²³⁾; group sessions⁽²⁴⁾; and motivational intervention, using techniques to encourage patients who are not currently ready to avoid some cardiovascular risk factors, such as tobacco or alcohol cessation, or physical activity^(21,22,24). Four reviews^(21,22,19,20) included studies that used drug therapies in combination with other interventions, but this was not the main focus of intervention effectiveness.

The professionals who carried out the interventions also varied (Table 2). These included nurses^(21,16,17,19,24,20), nutritionists or dietitians^(17,19,20), educators⁽¹⁷⁾, psychologists^(17,24), exercise instructors^(17,24), researchers⁽²⁴⁾ and doctors^(21,16,19).

The follow-up period was at least six months in four of the studies^(21,17,19,20) and at least 12 months in three studies^(16,22,23).

Only one of the studies⁽¹⁷⁾ provided information about the active duration of the intervention; the interventions were classified as low density when the intervention lasted 30 min or less, medium density when the intervention lasted from 31 min to six hours of contact and high intensity when the intervention lasted more than six hours of intervention. The other studies did not provide information about the active duration of the considered interventions.

Risk of bias within studies:

None of the reviews scored fewer than 3 points using the AMSTAR tool. Two were scored as acceptable^(21,16), three as good^(23,24,20), one as very good⁽²²⁾ and two as excellent^(17,19). The only criterion on the scale that was met by all studies was to specify the research question and inclusion criteria established for the selection of articles. The criteria that were most often not met were the inclusion of all articles included and excluded, and the publication bias assessment.

Outcome measures:

Four reviews^(21,23,19,20) provided information about the effectiveness of multifactorial interventions in reducing total mortality. Two^(21,19) provided the Odds Ratio (OR) close to 1; the third⁽²³⁾ provided net change in total mortality rates for five of the seven studies included in the review; and the fourth⁽²⁰⁾ indicated that only two of the included studies provided information about net changes in total mortality, but neither of the studies showed any clear effect.

Six reviews^(21,22,17,23,19,20) provided information on the interventions' effect on CVD mortality, and both studies by Ebrahim and colleagues reported an OR of about 1 for this variable^(21,19). The other four^(22,17,23,20) observed no clear intervention effect on cardiovascular mortality. Four of the reviews analyzed cardiovascular-related morbidity^(21,22,17,19), and only one of them⁽²²⁾ demonstrated a small effect related to multifactorial interventions. Three of the reviews included high-risk population^(21,19,20).

All eight reviews provided information about cardiovascular risk factors, and all showed a post-intervention decrease in DBP and SBP values. The reported effect for DBP ranged from -1.5⁽¹⁷⁾ to -4.2 mm Hg⁽²¹⁾, four of them with an effect over -2.71 mm Hg^(21,22,23,19). A reduction of at least -2.71 to -3.9 mm Hg was reported by the three studies with good-excellent quality evaluation^(22,23,19).

For SBP the reported effect ranged from -0.7⁽¹⁷⁾ to -4.2 mm Hg⁽²²⁾. An effect from -2.13 to -4.2 mm Hg was provided by studies with very good- excellent quality evaluation^(21,22,19). One study⁽¹⁷⁾ associated this decrease in DBP and SBP with high-intensity interventions. Another⁽²⁴⁾ indicated that these changes could not be guaranteed beyond a six-month follow-up. Three included high-risk population^(21,19,20). The individual motivational or counselling sessions based on risk factors, promotion of healthy diet such as restriction of sodium or salt intake and weight reduction, and advice about physical activity, supported with written and audiovisual material, were the techniques more often used for the DBP and SBP reduction.

Seven of the reviews^(21,22,16,17,22,19,20) reported changes in total cholesterol levels; in all cases, the intervention had a positive effect, although in one study⁽²²⁾ the mean net change was not statistically significant. The informed effect ranged from -0.01⁽²³⁾ to -0.24 mmol/L⁽¹⁹⁾. Three showed an effect over -0.14 mmol/L^(21,17,19), two excellent quality studies reported an effect above -0.17 mmol/L^(17,19). One study⁽¹⁷⁾ also reported a reduction in low-density lipoproteins during the follow-up period, associating both changes with high-intensity interventions. Of these, three included high-risk population^(21, 19,20). The techniques more often used were the individual motivational or counselling individual sessions' promotion of healthy intake with total fat restriction, increase of fruit and vegetables intake and advice about physical aerobic activity.

Four of the reviews^(22,16,17,24) reported changes in body composition or weight, indicating a positive effect on body composition. Because of the differences in the outcome measures, reduction of weight and reduction of BMI, unifying values was not possible. One of them⁽¹⁷⁾ associated this change with moderate- or high-intensity interventions. Another study⁽²⁴⁾ reported that these changes did not seem to be sustained beyond 18 months. Physical activity counselling, increase of fruit and vegetables intake and calorie restriction were the most effective techniques.

Six reviews reported tobacco consumption^(21,22,23,19,24, 20), although the reduction was considered non-significant in one study⁽¹⁹⁾ and as having no effect in another⁽²²⁾. Three of them included high-risk population^(21,19,20). Only two provided effect which ranged from -1.7% to -4.2%^(21,23).

4. DISCUSSION

To our knowledge, this systematic review is the first to synthesize the scientific evidence provided by the available systematic reviews evaluating the effectiveness of multifactorial interventions in the reduction of multiple cardiovascular risk factors carried out in the community setting. Our study provides evidence supporting that multifactorial community interventions are useful to improve cardiovascular risk factors levels and have a small, but potentially important, effect on population mortality. Moreover this systematic review highlights that multifactorial interventions seem to be more effective in the at-risk population and when they are carried out at a high level of intensity.

Only two of the included studies showed an effect of the multifactorial interventions in total mortality and cardiovascular mortality; effects were near to 1 and these studies have unequal quality evaluation. Therefore, this review shows a modest effect on total mortality and CVD mortality of interventions. Additionally, all the studies showed effect over blood pressure; the three studies with good-excellent quality evaluation reported an effect from -2.71 to -3.9 mm Hg for SBP and from -2.13 to -4.2 mm Hg for DBP. The reported effect for cholesterol by two excellent quality studies was above -0.17 mmol/L. As regards tobacco, six provided an unclear effect, and only three showed reduction over body mass index without a clear effect. Therefore, this review shows moderate effectiveness in improving cardiovascular risk factors. The risk factors that seem to be most susceptible to change are high blood pressure and total cholesterol. Finally, interventions that encourage lifestyle changes are effective in improving risk behaviors^(25,26), including eating habits^(27,28) or the combination of better eating habits and increased physical exercise⁽²⁹⁾.

These interventions have a small effect on total and cardiovascular mortality^(30,31,32), but one review⁽²⁰⁾ reflects a certain effectiveness of high-intensity interventions in reducing mortality. Nonetheless, because these are population-based interventions, small declines in incidence have great repercussions in absolute terms, and usually at low cost^(33, 34)

Motivational and counselling intervention with nutrition and physical activity advice were the most effective in producing risk factor modifications, although such benefits were not maintained for more than 12 months of follow-up⁽²⁴⁾. Interventions reduced blood pressure and cholesterol levels more effectively, because these are risk factors that can be modified in a short period of time⁽²⁴⁾. Moreover, smoking interventions require longer intervention periods to provoke

changes and observe whether the effects are maintained over time ⁽²⁰⁾. Otherwise, longer follow-up periods are needed to observe effects on total or cardiovascular mortality.

Finally, interventions including at-risk population have a higher probability of experiencing a demonstrable benefit, because these individuals are more likely to accept changes in behavior, although in some cases the effect could have been underestimated because some reviews included clinical trials involving participants in drug therapy ^(22,35), which could help to decrease the CVD ⁽³⁵⁾. Additionally, although the longest interventions seem to be effective, these would normally exceed the duration that is feasible in clinical practice.

Analysis of the effectiveness of these interventions is complicated by the large variety of the type of intervention programs, the target population, length of follow-up, the effects that are measured and the tools used to measure them. The possible use of drug therapy could also have effect, and other factors such as the socioeconomic level of the participants seem to influence the effectiveness of the interventions ⁽²³⁾.

TABLE 1. Characteristics of included studies

Authors	Ages	n	Follow-up (months)	Quality (AMSTAR*)	Total mortality	PAS (mmHg)	PAD (mmHg)	Cholesterol (mmol/L)	Body mass
Ebrahim and Smith	17-73	14 RCT	≥6	A	OR: 0.97 (0.92-1.02)	-4.2 (-3.8 to -4.6)	-2.7 (-2.5 to -2.9)	-0.14 (-0.12 to -0.16)	NA
Willisetal	18-65	5RCT	≥6	G	No effect	□!	!	!	NA
Lin et al	59.	73 CT	≥6+	E	NA	-1.5 (-0.9 to -2.1)	-0.7 (-0.6 to -0.9)	-0.17 (-0.09 to -0.25) (-0.13 LDL)	-0.48(-0.3 to -0.7 Kg/m2)
Ketola et al	18-65.	10 RCT	≥12	VG	NA	-3	-4.2	-0.36	-0.9 Kg
Pennant et al	NA	36 studies	≥12	G	No effect	-2.9	-1.1	-0.01	NA
Crouch, et al	16-65	9CT	NA	G	NA	!	!	NA	!
Fleming and Godwin	>18	7 RCT	≥12	A	NA	!	!	!	No effect

TABLE 2. Type of interventions and professionals who developed the interventions

Authors	Interventions	Professional
Ebrahim and Smith	Individualized sessions based on risk levels, to management of individual risk factors. Written and video educational materials. Support sessions. General health advice.	Nurses. Doctors.
Willis et al	Individualized sessions based on risk profile. Supporting literature (didactic brochures) Stress coping audiotapes. Support sessions.	Nurses. Nutritionists or dietitians. Behavioral scientists.
Lin et al	Individualized sessions based on risk levels. Written or audiovisual educational materials. Support sessions.	Nurses. Nutritionists or dietitians. Educators. Exercise instructors.
Ketola et al	Diet interventions (calorie restrictions, sodium intake restriction, total fat intake restriction). Advice to decrease alcohol consumption based on risk levels. Restriction on smoking. Programs of high-intensity exercise.	NA.
Pennant et al	Individualized sessions based on risk levels. Screening interventions. Individual and group counselling sessions and environmental changes.	Health departments. Local health committees. Voluntary organizations.

5. CONCLUSION

Since the multifactorial interventions analysed in the reviews included in this study are mainly community interventions conducted in population-based samples presenting a high prevalence of CVD risk factors, small improvements in the levels of those risk factors might be accompanied to not negligible reductions in the incidence for cardiovascular disease and mortality. Although there is no evidence about the combination of factors for which the interventions are most effective, SBP, DBP and cholesterol seem to be the CVD risk factors more likely to change. Therefore, the implementation of these interventions in the primary care setting can be recommended because, no matter how small the effect size, the potential impact is substantial.

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