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# THE EFFECT OF LIFESTYLE ADVICE AND INTERVENTIONS FOR CARDIOVASCULAR RISK REDUCTION : A COMPREHENSIVE SYSTEMATIC REVIEW

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## ABSTRACT

***Background:*** *The risk of cardiovascular disease (CVD) in general and coronary heart disease in particular is significantly influenced by daily behaviors and actions.*

***Methods:*** *This study demonstrated compliance with all requirements by means of a comparison with the standards established by the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020. Thus, the specialists were able to guarantee that the research was as current as feasible. Publications released between 2014 and 2024 were considered for this search strategy. This was accomplished by utilizing a number of distinct online reference sites, including Pubmed, ScienceDirect, and SagePub. It was determined that reviews, previously published works, and partially completed works would not be included.*

***Result:*** *In the PubMed database, the results of our search brought up 217 articles, whereas the results of our search on SAGEPUB brought up 3898 articles, our search on SCIENCE DIRECT brought up 10195 articles. The results of the search conducted for the last year of 2014 yielded a total 107 articles for PubMed, 1992 articles for SAGEPUB and 5649 articles for SCIENCE DIRECT. In the end, we compiled a total of 7 papers, 4 of which came from PubMed, 1 of which came from SAGEPUB and 2 of which came from SCIENCE DIRECT. We included seven research that met the criteria.*

***Conclusion:*** *In summary, daily behaviors and habits have a significant impact on the risk of CVD. The major strategies that reduce the risk of CVD and improve quality of life include stress reduction, increased physical activity, healthy diet, weight control, and abstinence from tobacco.*

**Keyword:** *Lifestyle advice, intervention, cardiovascular risk reduction*

## INTRODUCTION

Every individual's everyday actions have a significant impact on the risk of chronic illnesses in general and cardiovascular disease (CVD) in particular. The idea that maintaining a healthy weight, engaging in regular physical exercise, following good dietary guidelines, and abstaining from tobacco products can all dramatically lower the risk of CVD is backed by thousands of research. favorable daily habits and activities have been shown to have a favorable influence on health, as evidenced by the fact that almost all evidence-based clinical guidelines addressing the prevention and treatment of metabolically linked disorders include them. Numerous publications and guidelines from the American Heart Association (AHA) and the American College of Cardiology (ACC) also include these ideas.[1–3]

It has been challenging to make headway in assisting people in integrating these practices into their everyday lives, even in spite of the overwhelming data supporting healthy lifestyle measures. Although changes in lifestyle practices have been attributed mostly to the decline in CVD during the previous 20 years, significant obstacles still exist. For instance, the death rates from coronary heart disease (CHD) decreased by more than 40% in the United States between 1980 and 2000. However, CVD continues to be the primary cause of death globally. More than 37% of deaths in the US are caused by CVD each year. While improvements in lifestyle-related risk factors like quitting smoking, upping physical activity, and improving blood pressure and cholesterol control have been credited with almost half of the decline in CVD between 1980 and 2000, it's important to remember that increases in obesity and diabetes moved in the opposite direction and may undo the gains made in other lifestyle-related risk factors unless these negative trends are reversed.[3]

It has been incredibly challenging to assist patients in forming these routines and practices, even in the face of overwhelming evidence showing these characteristics have a substantial impact on both short- and long-term health and quality of life. For instance, the American Heart Association (AHA) found in its 2020 Strategic Plan that only 5% of people had "ideal cardiovascular health," which included a number of lifestyle factors like consistent exercise, a healthy diet, controlling weight, abstaining from tobacco use, and some cardiovascular health-related factors like blood pressure, cholesterol, and glucose control.[3]

Many of the tenets from the Dietary Guidelines for Americans 2015–2024 and the Physical Activity Guidelines for Americans 2018 are also incorporated into these efforts, which are primarily focused on treating or lowering CVD through lifestyle changes. The American College of Lifestyle Medicine is a newly formed academic institution that has quadrupled its membership annually over the last five years.[4] The goal of this review is to provide an overview of the most recent scientific research on the use of lifestyle practices and habits to reduce the risk of cardiovascular disease (CVD). This research is referred to as "lifestyle medicine."

## METHODS

### Protocol

The author of this study ensured that it complied with the standards by adhering to Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020 guidelines. This is done to guarantee the accuracy of the results that are derived from the investigation. Thus, the specialists were able to guarantee that the research was as current as feasible. Publications released between 2014 and 2024 were considered for this search strategy. This was accomplished by utilizing a number of distinct online reference sites, including Pubmed, ScienceDirect, and SagePub. It was determined that reviews, previously published works, and partially completed works would not be included.

### Criteria for Eligibility

In order to completse this literature evaluation, we looked at published research that discusses the effect of lifestyle advice and interventions to reduct the cardiovascular risk. This is done to enhance the patient's therapy management and to offer an explanation. This paper's primary goal is to demonstrate the applicability of the issues that have been noted overall.

To be eligible to participate in the study, researchers had to meet the following requirements: 1) English must be used to write the paper. The manuscript must fulfill both of these conditions in order to be considered for publication. 2) A few of the examined studies were released after 2013 but prior to the time frame considered relevant by this systematic review. Editorials, submissions without a DOI, already published review articles, and entries that are nearly exact replicas of journal papers that have already been published are a few examples of research that are prohibited.

### Search Strategy

We used "lifestyle advice", "intervention". and "cardiovascular risk reduction" out using the PubMed and SAGEPUB databases by inputting the words: (("heart disease risk factors"[MeSH Terms] OR ("heart"[All Fields] AND "disease"[All Fields] AND "risk"[All Fields] AND "factors"[All Fields]) OR "heart disease risk factors"[All Fields] OR ("cardiovascular"[All Fields] AND "risk"[All Fields]) OR "cardiovascular risk"[All Fields]) AND ("reduction"[All Fields] OR "reductions"[All Fields]) AND (("life style"[MeSH Terms] OR ("life"[All Fields] AND "style"[All Fields]) OR "life style"[All Fields] OR "lifestyle"[All Fields] OR "lifestyles"[All Fields]) AND ("advice"[All Fields] OR "advices"[All Fields])) AND (("life style"[MeSH Terms] OR ("life"[All Fields] AND "style"[All Fields]) OR "life

style"[All Fields] OR "lifestyle"[All Fields] OR "lifestyles"[All Fields]) AND ("intervention s"[All Fields] OR "interventions"[All Fields] OR "interventive"[All Fields] OR "methods"[MeSH Terms] OR "methods"[All Fields] OR "intervention"[All Fields] OR "interventional"[All Fields])) AND (2014:2024[pdat]) used in searching the literature.

## Data retrieval

After reading the abstract and the title of each study, the writers performed an examination to determine whether or not the study satisfied the inclusion criteria. The writers then decided which previous research they wanted to utilise as sources for their article and selected those studies. After looking at a number of different research, which all seemed to point to the same trend, this conclusion was drawn. All submissions need to be written in English and can't have been seen anywhere else.

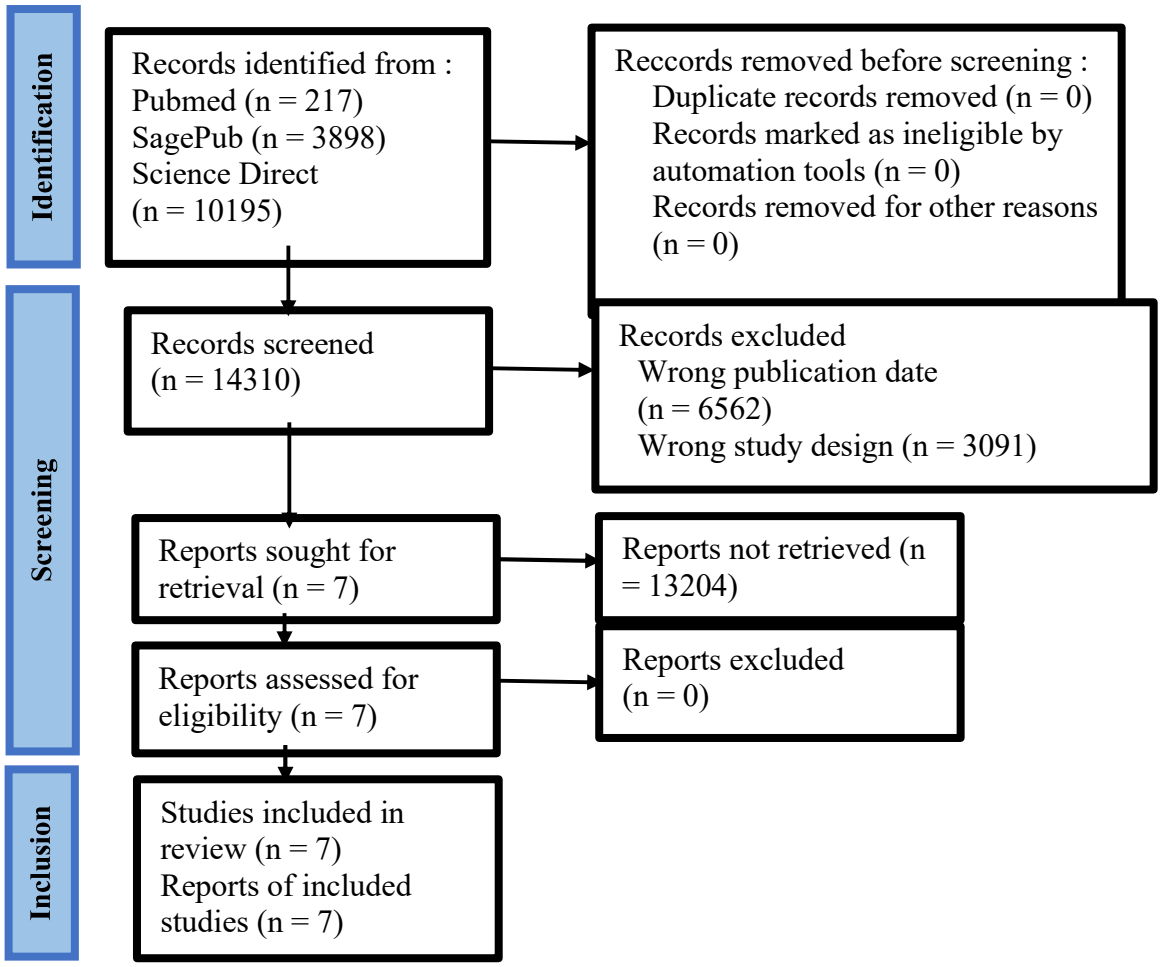


**Figure 1. Prisma Flow Diagram**

Only those papers that were able to satisfy all of the inclusion criteria were taken into consideration for the systematic review. This reduces the number of results to only those that are pertinent to the search. We do not take into consideration the conclusions of any study that does not satisfy our requirements. After this, the findings of the research will be analysed in great detail. The following pieces of information were uncovered as a result of the inquiry that was carried out for the purpose of this study: names, authors, publication dates, location, study activities, and parameters.

## Quality Assessment and Data Synthesis

Each author did their own study on the research that was included in the publication's title and abstract before making a decision about which publications to explore further. The next step will be to evaluate all of the articles that are suitable for inclusion in the review because they match the criteria set forth for that purpose in the review. After that, we'll determine which articles to include in the review depending on the findings that we've uncovered. This criteria is utilised in the process of selecting papers for further assessment. in order to simplify the process as much as feasible when selecting papers to evaluate. Which earlier investigations were carried out, and what elements of those studies made it appropriate to include them in the review, are being discussed here.

## RESULT

In the PubMed database, the results of our search brought up 217 articles, whereas the results of our search on SAGEPUB brought up 3898 articles, our search on SCIENCE DIRECT brought up 10195 articles. The results of the search conducted for the last year of 2014 yielded a total 107 articles for PubMed, 1992 articles for SAGEPUB and 5649 articles for SCIENCE DIRECT. In the end, we compiled a total of 7 papers, 4 of which came from PubMed, 1 of which came from SAGEPUB and 2 of which came from SCIENCE DIRECT. We included seven research that met the criteria.

Dennison, et al[5] (2018) showed that low mood and high stress may lessen the chance and degree of reported changes in FVI and PA after receiving advice and information about CVD risk. A higher FVI may be linked to more social support. Future treatments should take psychological elements into account when designing, implementing, and assessing them.

Stuart, et al[6] (2014) showed that reductions in LDL-C and total cholesterol can be achieved by administering CLIP through an already-existing telephone health service. Although CLIP may be more widely used to promote primary CVD prevention, longer-term cost-effectiveness studies are necessary.

Khouja, et al[7] (2020) showed that 31 women with moderate-to-high CVD risk saw a successful reduction in their 10-year risk of the disease over the course of the three-month intervention period by implementing a complete program customized to each individual's risk. The intervention enhanced the FRS overall. These findings underscore the significance of comprehensive, multimodal, and multidisciplinary programs that enhance cardiovascular disease risk reduction, foster healthy habits, and encourage active lives in individuals at risk for the condition.

Saffi, et al[8] (2014) showed that a structured and methodical approach to lifestyle counseling by nurses successfully lowered the cardiovascular risk score.

**Table 1. The litelature include in this study**

| Author | Origin | Method | Sample | Result |
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| **Dennison et al, 2018**[5] | United Kingdom | Randomized controlled trial | 716 patients | Social support did not appear to be significantly correlated with changes in either subjective or objective PA. Smaller improvements in self-reported PA were linked to higher levels of stress and, to a lesser degree, depressive symptoms (β -1.53 h/week vigorous PA, 95% confidence interval (CI) -2.30 to -0.75, $p < 0.001$ for stress; β -1.64 h/week, 95% CI -3.50 to 0.21, $p = 0.082$ for little interest). The chances of raising self-reported FVI to five parts per day were found to be higher in those with more social support and lower in those with higher stress (odds ratio (OR) 1.33, 95% confidence interval (CI) 1.05 to 1.69, $p = 0.020$ for social support and OR 0.57, 95% confidence interval (CI) 0.43 to 0.76, $p < 0.001$ for stress). Psychosocial variables and objective FVI did not significantly correlate, according to statistical analysis. |
| **Stuart et al, 2014**[6] | Australia | Randomized controlled trial | 49 patients | When compared to the control group (EM = 3·23 (se 0·18) mmol/l and EM = 4·77 (se 0·22) mmol/l, respectively), CLIP participants showed substantially larger reductions |

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| | | | | in LDL-C (estimated mean (EM) = 1·98 (se 0·17) mmol/l) and total cholesterol (EM = 3·61 (se 0·21) mmol/l) at Week 12. For systolic blood pressure (F(1,45) = 0·28, P = 0·60), diastolic blood pressure (F(1,43) = 0·52, P = 0·47), weight (F(1,42) = 3·63, P = 0·063), and waist circumference (F(1,43) = 0·32, P = 0·577), there were no significant treatment effects. |
| **Khouja et al, 2020**[7] | Saudi Arabia | Randomized controlled trial | 60 patients | 42 ± 8 years was the mean age of the participants. Reductions were higher in the intervention group and the difference between the groups was statistically significant ($p < 0.05$) at the three-month follow-up. Systolic blood pressure (-9.2 mmHg), blood glucose (-45 mg/dL), and the Framingham risk score (-13.6) were all significantly decreased by the lifestyle modification program. The Framingham risk score significantly improved, according to linear regression analysis ($p < 0.01$). |
| **Saffi et al, 2014**[8] | Brazil | Randomized clinical trial | 74 patients | There were 74 patients in the final sample; 38 were in the intervention group and 36 were in the control group. 58 ± 9 years was the mean age, and 74% of the patients were male. The intervention group saw a 1.7 point (-13.6%) decrease in risk score, while the control group experienced a 1.2 point (+11%) increase in risk score (p=0.011). Weight (intervention: 78 ± 14 kg at baseline vs 77 ± 14 kg at study end; control: 78 ± 15 kg vs 79 ± 15 kg; p=0.04), systolic blood pressure (intervention: 136 ± 22 mm Hg vs 124 ± 15 mm Hg; control: 126 ± 15 mm Hg vs 129 ± 16 mm Hg; p=0.005), and diastolic blood pressure were found to be significantly different between the groups. |
| **Guo et al, 2022**[9] | China | Randomized clinical trial | 6645 patients | Reducing fat intake, managing weight, and upping exercise received support from 80.9%, 80.7%, and 72.7% of devotees, respectively. Between 1999 and 2000 and 2009–2010, there was a substantial rise in the |

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| | | | | proportion of followers for both weight control and increased exercise (both P trend <0.05). Compared to non-adherents, adherents exhibited lower total cholesterol/HDL-C ratios and higher levels of high-density lipoprotein cholesterol (HDL-C) (P for difference <0.05 for all). Adherents to increased exercise had a reduced CVD mortality (Hazard ratio 0.70, 95% CI 0.51–0.97) and odds ratio of 10-year intermediate-to-high ASCVD risk (Odd ratio 0.73, 95% confidence interval [CI] 0.56–0.95) than non-adherents. |
| **Zheng et al, 2020**[10] | Hong Kong | Randomized controlled trial | 173 patients | There was no discernible difference between the two groups' baseline characteristics. The lifestyle intervention group had a lower cardiovascular risk, but there was no discernible group-by-time impact. At one month, there had been substantial gains in the self-efficacy for nutrition, stress dimension, and total score of health-promoting behaviors (all $p < 0.05$). At three months, significant gains were also noted in all subscales, the sum score of health-promoting behaviors, all dimensions, and the overall self-efficacy scale (all $p < 0.05$). |
| **Lotfaliany et al, 2020**[11] | Australia | Randomized controlled trial | 1007 patients | A 12-month structured peer-support lifestyle intervention program with 15 group sessions and related community activities was given to participants from 30 intervention communities with the goal of promoting and sustaining lifestyle change. The Framingham Risk Score was used to estimate the 10-year CVD risk at two years, which was the main result of this investigation. With a baseline mean age of 46.0 years, 47.2% of the population was female. The research groups' baseline 10-year CVD risk was comparable. At two years, the follow-up rate was 95.7%. Between study groups, the absolute risk decrease in the estimated 10-year CVD |

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| | | | | risk was 0.69% at one year and 0.69% at two years. The decrease in tobacco usage was primarily responsible for the beneficial change in CVD risk with the intervention condition. |

Guo, et al[9] (2022) showed that health personnel's lifestyle recommendations were accepted to a comparatively high and growing degree. In clinical practice, healthcare providers should be encouraged to suggest lifestyle changes to persons with high cholesterol, given the improved lipid profile and decreased risk of cardiovascular disease among devotees.

Zheng, et al[10] (2020) showed that patients with metabolic syndrome saw significant improvements in their self-efficacy and adoption of health-promoting behaviors as a result of the nurse-led Health Promotion Model guided lifestyle intervention program.

Lotfaliany, et al[11] (2020) showed that for those in India who are at high risk of acquiring type 2 diabetes, this low-cost, peer-supported lifestyle intervention might considerably lower their risk of cardiovascular disease (CVD). In diabetes preventive programs, quitting smoking should be one of the goals for changing one's lifestyle in order to lower the risk of CVD. For those in India who are at high risk of acquiring diabetes, a community-based peer-support lifestyle intervention may lower their chance of cardiovascular disease (CVD).

## DISCUSSION

The risk of cardiovascular disease (CVD) in general and coronary heart disease in particular is significantly influenced by daily behaviors and actions. It has been shown that quitting smoking, maintaining a healthy weight, getting regular exercise, and eating well all considerably lower the risk of CVD.[3]

Dennison, et al in their study with 716 patients with 56% male in the mean age 57 years old that randomized to see the impact of CVD risk and lifestyle information. The result of this study showed that the increased of stress and decreased of the mood may lessen the possibility and magnitude of reported changes in PA and FVI as a result of advice and information about CVD risk. A higher FVI may be linked to more social support. Future treatments should take psychological elements into account when designing, implementing, and assessing them.[5]

Forty nine men and women with age 48 years old as average was randomized into 2 groups using objective measures of weight loss and CVD risk reduction, assess a primary preventive care approach that uses telephone suppaort provided through an established health call center to individuals referred by general practitioners who are at risk of developing CVD. CLIP (cardiovascular lifestyle programme) is effective to decreaced the LDL-C and total cholesterol.[6]

Globally, cardiovascular disease (CVD) continues to be the leading cause of death. Implementing a thorough interventional program might lower the prevalence of cardiovascular disease and its aftereffects. Research by Khouja, et al with the mean age of the participants 42 years old, with three months follow up in 60 patients showed after three months, a customized lifestyle modification program improved the 10-year cardiovascular Framingham risk score in a cohort of women with moderate-to-high risk of CVD.[7]

Saffi, et al randomized 74 patients with 38 in intervention group and 36 patients in control group. This study aimed to assess the impact of structured, personalized lifestyle counseling sessions conducted by nurses on patients with coronary artery disease (CAD) and their 10-year cardiovascular risk scores.A structured and methodical approach to lifestyle counseling by nurses successfully lowered the cardiovascular risk score.[8]

Study by Guo, et al in 6645 patients recommended to eat less fat with 80.95 of totals following the advice. There is little information available about the relationship between high blood cholesterol and following lifestyle recommendations from medical experts and cardiovascular disease (CVD). Our goal was to investigate the percentage of high-cholesterol individuals who follow lifestyle recommendations and how this affects their lipid profile and risk of CVD.[9]

A collection of cardio-metabolic risk factors, metabolic syndrome poses a significant threat to public health because of its rising incidence and detrimental impact on cardiovascular health. The primary line of treatment for managing metabolic syndrome is lifestyle change. However, individuals with metabolic syndrome may find it difficult to adopt healthful behaviors. Zheng, et al in their study of 173 patients randomly assign into 86 patients in lifestyle interventions and 87 patients receive usual care from study hospital.[10]

## CONCLUSION

In summary, daily behaviors and habits have a significant impact on the risk of CVD. The major strategies that reduce the risk of CVD and improve quality of life include stress reduction, increased physical activity, healthy diet, weight control, and abstinence from tobacco.

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