

Primary Health Care Approaches to the Prevention of Heart Attacks among Middle-Aged Adults: A Secondary Evidence-Based Review

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Abstract— Heart attacks, clinically known as myocardial infarctions, remain a major public health concern among middle-aged adults because they are commonly associated with risk factors that develop silently over time, including hypertension, diabetes, high cholesterol, obesity, smoking, poor diet, stress and physical inactivity. This paper examines primary health care approaches to the prevention of heart attacks among middle-aged adults, with emphasis on early identification, risk reduction and continuity of care. A secondary evidence-based review method was adopted, drawing mainly on peer-reviewed journal articles, cardiovascular prevention guidelines and relevant empirical and review studies on non-communicable disease prevention. The review indicates that primary health care is central to heart attack prevention because it provides the first opportunity for routine cardiovascular screening, health education, lifestyle counselling and long-term monitoring of at-risk adults. Key preventive strategies include regular blood pressure checks, blood glucose assessment, cholesterol screening, weight monitoring, dietary counselling, physical activity promotion, smoking cessation support, alcohol reduction, stress management and adherence support for prescribed medications. The findings further show that effective control of hypertension, diabetes and cholesterol at the primary care level can reduce the progression of cardiovascular risk before it results in acute myocardial infarction. However, prevention may be weakened by low awareness, poor health-seeking behaviour, limited diagnostic capacity, medication cost and weak referral systems. The paper concludes that strengthening primary health care is essential for early detection, sustained risk-factor control and the prevention of heart attacks among middle-aged adults.

Keywords— Primary health care, heart attack, myocardial infarction, middle-aged adults, cardiovascular disease, prevention.

I. INTRODUCTION

Cardiovascular disease remains one of the most persistent public-health burdens because it combines high mortality, long-term disability and substantial health-system demand across both high-income and low- and middle-income settings (Roth et al., 2020). According to Roth et al. (2020), ischaemic heart disease alone accounted for about 197 million prevalent cases and 9.14 million deaths globally in 2019, showing that myocardial infarction should not be treated as an isolated emergency event but as an outcome of cumulative cardiovascular risk. Similarly, Vaduganathan et al. (2022) argued that cardiovascular disease has remained the leading global cause of death despite improvements in treatment, which suggests that hospital-based management alone cannot sufficiently reduce the burden. Although acute myocardial infarction requires urgent specialist care,

Magnussen et al. (2023) demonstrated that five modifiable factors, namely body mass index, systolic blood pressure, non-HDL cholesterol, smoking and diabetes, accounted for 57.2% of incident cardiovascular disease in women and 52.6% in men. These data refute the assumption that heart attacks are largely unavoidable, because much risk is measurable, modifiable and preventable before a crisis occurs (Magnussen et al., 2023).

Middle-aged adults are a critical population because cardiovascular risk often becomes clinically visible between 40 and 64 years, when prolonged exposure to hypertension, dyslipidaemia, diabetes, smoking, excess weight and sedentary behaviour begins to translate into coronary events (Dugani et al., 2021). Dugani et al. (2021), in a systematic review and meta-analysis of 77 studies from 58 countries, reported that

current smoking increased the odds of premature myocardial infarction by 4.34, diabetes by 3.54, dyslipidaemia by 2.94 and hypertension by 2.85, while body mass index of at least 25 kg/m² also increased risk. This evidence challenges a narrow biomedical interpretation of myocardial infarction as a problem of older age alone; rather, middle age represents a prevention window in which risk is present but still more responsive to behavioural and clinical control (Dugani et al., 2021). However, risk-factor control cannot be reduced to individual responsibility alone, because access to screening, medication affordability and continuity of counselling shape whether adults can act on prevention advice (Mulure et al., 2024).

Primary health care is central to myocardial infarction prevention because it is the most appropriate level for early cardiovascular risk identification, repeated contact and long-term behaviour support before complications require hospital admission (O'Connor et al., 2020). O'Connor et al. (2020) found that primary care-relevant behavioural counselling interventions for adults with cardiovascular risk factors reduced cardiovascular events by 20% in pooled trial evidence, indicating that counselling is clinically preventive when delivered with sufficient contact. In contrast, weak primary care shifts the system toward late presentation, where care becomes more expensive, specialist-dependent and less able to prevent irreversible myocardial damage (Mulure et al., 2024). Therefore, the preventive function of primary health care should include routine blood pressure checks, glucose and lipid assessment, smoking-cessation support, diet and physical-activity counselling, medication-adherence support and timely referral for high-risk or symptomatic patients (O'Connor et al., 2020; Bredehorst et al., 2025).

Although the literature strongly supports cardiovascular prevention, implementation remains uneven, particularly where health systems emphasise secondary care and emergency treatment more than structured risk reduction at community and primary-care levels (Mulure et al., 2024). Mulure et al. (2024) identified patient, provider and health-system barriers to primary cardiovascular prevention in low- and middle-income countries, including low motivation,

asymptomatic risk factors, inadequate infrastructure, medication stock-outs, limited consultation time and weak shared decision-making. This gap is significant because myocardial infarction is commonly managed after onset, whereas the most cost-effective preventive opportunities occur earlier through primary care contact, risk-factor monitoring and sustained lifestyle support (O'Connor et al., 2020). This article therefore examines primary health care approaches to the prevention of heart attacks among middle-aged adults using evidence from secondary sources (Sukhera, 2022).

II. METHODS

This article adopted a secondary evidence-based narrative review design because the aim was to critically synthesise existing empirical and review literature rather than collect primary survey, interview or clinical data (Sukhera, 2022). A narrative review was suitable because the topic cuts across epidemiology, primary care, behavioural counselling and cardiovascular risk management, which require interpretive synthesis rather than a single pooled estimate (Sukhera, 2022).

Data were drawn from peer-reviewed journal articles indexed in PubMed, Google Scholar, ScienceDirect, JAMA Network, Elsevier and SpringerLink, with priority given to studies published between 2015 and 2025 and available through DOI-linked journal records (Dhollande et al., 2021). The review prioritised peer-reviewed sources over blogs, opinion pieces and non-academic grey literature to improve credibility (Dhollande et al., 2021).

The search combined cardiovascular, population and primary-care terms, including “primary health care and heart attack prevention,” “myocardial infarction prevention,” “cardiovascular disease prevention,” “middle-aged adults and heart disease,” “hypertension screening,” “lifestyle modification and cardiovascular risk,” “smoking cessation and myocardial infarction,” and “primary care cardiovascular risk management” (Nowell et al., 2017). These terms were broad enough to capture prevention evidence but specific enough to exclude unrelated cardiology literature focused only

on acute hospital treatment or post-infarction rehabilitation (Nowell et al., 2017).

Included sources addressed cardiovascular disease or myocardial infarction prevention, primary health care, adult populations, hypertension, diabetes, cholesterol, obesity, smoking, diet, physical activity, medication adherence or referral systems (Dhollande et al., 2021). Excluded sources were blogs, unsupported editorials, non-adult studies, articles without clear methodological relevance, studies focused only on children or adolescents and papers concerned only with acute hospital management after myocardial infarction (Dhollande et al., 2021).

Findings were organised using thematic synthesis because this allowed evidence to be grouped under risk factors, primary health care interventions, implementation challenges and recommendations (Nowell et al., 2017). Thematic organisation was appropriate because it preserved the practical orientation of the article while allowing comparison, contrast and critical interpretation across diverse secondary sources (Nowell et al., 2017).

III. THEMATIC RESULTS

The reviewed literature produced five connected themes: clustered risk factors, early screening, lifestyle counselling, clinical risk control and continuity of care. These themes are presented as “results” because this article did not generate primary field data but

synthesised secondary evidence into practical primary health care implications.

3.1 Major Risk Factors for Heart Attacks among Middle-Aged Adults

The reviewed evidence shows that heart attack risk among middle-aged adults is not produced by a single exposure but by the accumulation of modifiable cardiometabolic and behavioural risks. According to Magnussen et al. (2023), five factors, namely body mass index, systolic blood pressure, non-HDL cholesterol, smoking and diabetes, accounted for 57.2% of incident cardiovascular disease in women and 52.6% in men, which makes prevention more defensible than a purely hospital-based response. Similarly, Dugani et al. (2021) found that smoking had the strongest association with premature myocardial infarction (OR=4.34), followed by diabetes (OR=3.54), dyslipidaemia (OR=2.94), hypertension (OR=2.85) and body mass index ≥ 25 kg/m² (OR=1.46). This evidence challenges the assumption that myocardial infarction in middle age is mainly genetic or sudden, because measurable risks explain much of the burden. Nevertheless, family history and psychosocial stress should not be dismissed, because they can intensify vulnerability through health behaviour, inflammation, blood pressure and delayed health-seeking (Levine, 2022). Therefore, primary prevention must treat risk as clustered rather than isolated.

3.2 Screening and Early Detection at Primary Health Care Level

Table 1: Major Risk Factors for Heart Attacks among Middle-Aged Adults

Risk Factor	Evidence-Based Link to Heart Attack	Primary Health Care Response
Hypertension	Increases coronary artery pressure and vascular damage	Routine BP screening and adherence counselling
Diabetes	Damages blood vessels and increases atherosclerosis risk	Blood glucose testing, lifestyle counselling and medication follow-up
High cholesterol	Promotes plaque formation in coronary arteries	Lipid screening, diet counselling and statin referral where needed
Obesity	Increases risk of hypertension, diabetes and dyslipidaemia	BMI/waist monitoring and weight-control counselling
Smoking	Damages blood vessels and increases clot formation	Brief cessation counselling and follow-up support
Physical inactivity	Increases obesity and metabolic risk	Exercise counselling and community-based activity promotion

Screening emerged as a central primary health care strategy because the most dangerous cardiovascular risks are often asymptomatic until coronary injury becomes advanced. According to Guirguis-Blake et al. (2021), hypertension screening is clinically important because blood pressure is modifiable and antihypertensive treatment reduces cardiovascular and total mortality; however, office measurements may misclassify patients through white-coat or masked hypertension. This means primary care screening should not end with one clinic reading but should include repeat measurement, home or ambulatory confirmation where possible, and risk interpretation. In addition, Arnett et al. (2019) suggest that cardiovascular prevention requires assessment of blood pressure, lipid profile, diabetes status, body weight, smoking and lifestyle pattern rather than reliance on symptoms. Although sophisticated biomarkers may appear attractive, basic tools, including blood pressure measurement, glucose testing, cholesterol assessment, body mass index, waist circumference, family history and global risk scoring, are more feasible for primary care and more directly actionable. Thus, early detection is valuable only when screening is linked to counselling, treatment initiation and follow-up.

3.3 Health Education and Lifestyle Counselling

The evidence indicates that lifestyle counselling is preventive when it is structured, repeated and connected to individual risk, rather than delivered as generic advice. O'Connor et al. (2020) reported that medium- and high-contact behavioural counselling interventions for adults with cardiovascular risk factors reduced cardiovascular events and improved blood pressure, LDL cholesterol and adiposity outcomes, although physical activity findings were more variable. This finding refutes the weak assumption that advice alone is sufficient; instead, primary health care counselling must include goal-setting, follow-up, problem-solving and culturally realistic dietary guidance. Diet counselling is especially important because Aliasgharzadeh et al. (2022) found that salt substitution reduced systolic blood pressure by 7.44 mmHg and nutrition education reduced it by 2.75 mmHg, supporting salt reduction as a measurable rather than symbolic intervention.

Smoking counselling is equally important because Cho et al. (2024) found, in over 5.3 million participants, that smoking had a dose-dependent association with cardiovascular disease and that heavy ex-smokers required more than 25 years for residual risk to align with never-smokers. Therefore, counselling should address diet, salt intake, physical activity, smoking, alcohol, sleep, stress, routine checks and warning signs.

3.4 Control of Hypertension, Diabetes and Cholesterol

The thematic evidence further shows that primary prevention depends not merely on detecting risk but on controlling it over time. Rahimi et al. (2021) reported that a 5 mmHg reduction in systolic blood pressure lowered major cardiovascular events by about 10%, demonstrating that even modest blood pressure control can have population-level significance. In contrast, poor control of multiple risks weakens prevention because diabetes, hypertension and dyslipidaemia interact biologically through vascular injury, atherosclerosis and inflammatory pathways. Su et al. (2025), using primary care records from 36,211 adults with both diabetes and hypertension, found that high adherence to antidiabetic and statin monotherapy was associated with lower all-cause mortality risk (aHR=0.67 and aHR=0.68 respectively), although simultaneous adherence to three medications did not significantly reduce cardiovascular outcomes. This mixed finding is important because it prevents an overclaim that medicines alone solve prevention. Instead, it suggests that medication adherence, affordable drug supply, monitoring, patient education and regular follow-up must operate together.

3.5 Referral, Follow-Up and Continuity of Care

Referral and continuity of care emerged as the mechanism through which primary health care connects community prevention to specialist support. Patients with severe hypertension, uncontrolled diabetes, persistent chest discomfort, suspected angina, abnormal lipid profiles or multiple clustered risks require timely referral, because primary care prevention becomes unsafe when warning signs are normalised or delayed. However, referral alone is insufficient where patients are not traced after transfer,

because cardiovascular prevention requires sustained monitoring rather than episodic contact. Soltani et al. (2021) found that community-based cardiovascular prevention programmes reduced systolic blood pressure by 2.90 mmHg, diastolic blood pressure by 2.21 mmHg, LDL cholesterol by 8.88 mg/dL and fasting blood glucose by 2.06 mg/dL, suggesting that community-linked care can extend prevention beyond clinic walls. Similarly, Belete et al. (2023) found that mobile text reminders improved medication adherence among adults with type 2 diabetes (SMD=0.36), while

Redfern et al. (2024) cautioned that text messaging evidence for cardiovascular patients remains uncertain and requires stronger long-term trials. These findings imply that patient reminders, family support, referral tracking and digital follow-up are useful continuity tools, but they should complement rather than replace direct primary care contact. Overall, the results suggest that the primary health care approach is strongest when screening, counselling, drug adherence, referral and follow-up operate as one prevention pathway rather than separate activities.

Table 2: Primary Health Care Interventions for Heart Attack Prevention

Risk Area	Primary Health Care Intervention	Expected Preventive Outcome
Hypertension	Routine BP checks and adherence counselling	Reduced myocardial infarction risk
Diabetes	Blood glucose monitoring and lifestyle counselling	Improved vascular protection
Obesity	Weight monitoring and diet/exercise support	Reduced cardiovascular risk
Smoking	Brief cessation counselling	Reduced coronary artery damage
Poor follow-up	Reminder systems and referral tracking	Improved continuity of care

IV. DISCUSSION

The findings indicate that primary health care should be treated as the first line of heart attack prevention because major cardiovascular risks often remain silent until acute myocardial infarction occurs (NCD Risk Factor Collaboration, 2021). According to NCD Risk Factor Collaboration (2021), the global number of adults aged 30 to 79 years with hypertension doubled between 1990 and 2019, rising from 331 million women and 317 million men to 626 million women and 652 million men. This evidence is important because hypertension is frequently asymptomatic, yet it is strongly linked to coronary heart disease, stroke and premature mortality (NCD Risk Factor Collaboration, 2021). Although hospital care is necessary during acute myocardial infarction, Rahimi et al. (2021) showed that a 5 mmHg reduction in systolic blood pressure reduced major cardiovascular events by about 10%, which confirms that earlier control can prevent later emergencies. Therefore, the rational argument is that primary health care does not merely support treatment access; it interrupts the disease pathway before coronary damage becomes clinically severe (Rahimi et al., 2021).

The evidence also suggests that screening alone is inadequate unless it is integrated with counselling, treatment support, lifestyle modification and referral (O'Connor et al., 2020). O'Connor et al. (2020) found that medium and high contact behavioural counselling interventions for adults with cardiovascular risk factors reduced cardiovascular events, blood pressure, LDL cholesterol and adiposity outcomes. However, this does not mean that counselling can replace medication or clinical monitoring, because cardiovascular risk is often produced by interacting biological and behavioural factors (Arnett et al., 2019). Instead, prevention becomes stronger when blood pressure checks, lipid testing, glucose monitoring, diet counselling, physical activity support, smoking cessation, medication adherence and referral are delivered as one coordinated primary care pathway (Arnett et al., 2019). This integrated approach is more convincing than isolated health talks because it links risk detection to practical action, and it reduces the gap between knowing one's risk and actually controlling it (O'Connor et al., 2020).

Despite the preventive value of primary health care, implementation is weakened by patient, provider and system barriers (Mulure et al., 2024). Mulure et al.

(2024) found that primary cardiovascular prevention in low and middle income countries is constrained by low awareness, asymptomatic risk factors, limited consultation time, insufficient infrastructure, medication stock outs and weak shared decision making. Similarly, Attaei et al. (2017) reported that the availability of four classes of blood pressure lowering medicines was 94% in high income communities but only 13% in low income communities, showing that advice cannot translate into prevention where medicines are unavailable. Chow et al. (2020) further found that lower availability and affordability of essential cardiovascular medicines were associated with higher risks of major adverse cardiovascular events and mortality. These findings challenge the simplistic view that poor prevention is mainly caused by patient negligence; rather, weak screening capacity, drug cost, workforce shortages and referral failure also shape prevention outcomes (Mulure et al., 2024).

The public health implication is that strengthening primary health care can reduce heart attack risk by moving cardiovascular prevention from episodic treatment to continuous risk management (Leong et al., 2021). Leong et al. (2021) argued that task shifting in primary care can improve outcomes such as blood pressure and HbA1c while addressing health worker shortages. In addition, Ndejjo et al. (2021) found that community based cardiovascular interventions in low and middle income countries improved knowledge of cardiovascular disease and influenced physical activity and dietary practices. Therefore, primary health care strengthening should be understood as a population prevention strategy, not only a clinic improvement strategy (Ndejjo et al., 2021).

A limitation of this review is that it did not conduct a meta-analysis or appraise all included studies using a formal quality-assessment tool; therefore, the findings should be interpreted as a thematic synthesis of available secondary evidence rather than pooled statistical evidence.

V. RECOMMENDATIONS

Primary health care centres should routinely screen middle-aged adults for blood pressure, blood glucose, cholesterol, body mass index, waist circumference,

smoking, alcohol use and family history (Arnett et al., 2019). This is necessary because early risk identification is more clinically useful and less costly than treating myocardial infarction after coronary damage has occurred (Rahimi et al., 2021).

Health education should be extended beyond clinic settings into workplaces, religious centres, markets, community associations and media platforms (Ndejjo et al., 2021). This approach is justified because many middle-aged adults may not attend clinics until symptoms become serious, while community education can improve risk awareness before emergency presentation (Ndejjo et al., 2021).

Primary health care centres should provide structured counselling on diet, salt reduction, physical activity, weight control, smoking cessation, alcohol reduction, stress management and sleep hygiene (O'Connor et al., 2020). This recommendation is stronger than generic lifestyle advice because evidence shows that repeated behavioural counselling produces better cardiovascular outcomes than brief, unsupported advice (O'Connor et al., 2020).

Health systems should improve access to affordable antihypertensive, antidiabetic and lipid lowering medicines through reliable supply chains, generic medicine availability and patient education (Attaei et al., 2017). This is essential because Chow et al. (2020) showed that poor availability and affordability of cardiovascular medicines are associated with worse cardiovascular outcomes and mortality.

Primary health care centres should establish clear referral pathways for high risk patients and ensure follow-up after referral through phone reminders, community health worker tracing and family supported care (Ajisegiri et al., 2023). Ajisegiri et al. (2023) showed that community health workers already support hypertension and diabetes care in Nigerian primary health facilities, but their contribution requires stronger training, equipment supply and referral coordination.

VI. CONCLUSION

This article has shown that heart attacks among middle-aged adults are strongly connected to

preventable and controllable risk factors, particularly hypertension, diabetes, dyslipidaemia, obesity, smoking, poor diet and physical inactivity (Dugani et al., 2021). Although myocardial infarction is often treated as an acute hospital emergency, the evidence reviewed suggests that many of its risk pathways begin earlier and can be detected at primary health care level (NCD Risk Factor Collaboration, 2021). Primary health care is therefore central to prevention because it supports screening, health education, lifestyle counselling, medication adherence, risk factor control, referral and follow-up (O'Connor et al., 2020).

However, prevention will remain weak where screening equipment, medicines, trained workers and referral systems are inadequate (Mulure et al., 2024). Strengthening primary health care can therefore reduce heart attack risk among middle-aged adults by turning prevention into a continuous, accessible and community based process (Ndejjo et al., 2021).

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