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Managing Cardiovascular Disease Through a Multidisciplinary Lens: A Literature Review of the Roles of Nursing, Pharmacy, Laboratory Testing, Physiotherapy, Sociology, and Health Administration

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Abstract

Cardiovascular disease (CVD) remains the leading global cause of morbidity and mortality. Contemporary evidence indicates that multidisciplinary, team-based models—integrating nursing, pharmacy, laboratory medicine, physiotherapy, sociology, and health administration—improve adherence to guidelines and clinical outcomes across the care continuum while exposing persistent implementation gaps. To critically evaluate and synthesize literature on multidisciplinary CVD management, delineating role-specific contributions, collaborative mechanisms, and system enablers that translate evidence into routine practice. A literature review was conducted using PubMed and Google Scholar (2020–2024). MeSH and free-text terms covered CVD, multidisciplinary/integrated care, and discipline-specific roles. Eligible peer-reviewed studies (English) included primary research, systematic reviews/meta-analyses, or major guideline statements reporting clinical, behavioral, or organizational outcomes. Nursing interventions consistently improved adherence, risk profiles, and readmission rates. Pharmacist-involved models yielded significant blood pressure reductions, safer pharmacotherapy, and better lipid control, especially under explicit collaborative protocols. Laboratory integration—particularly high-sensitivity troponin pathways and natriuretic peptide use—accelerated accurate diagnosis and informed heart failure management. Physiotherapy via exercise-based cardiac rehabilitation reduced mortality and hospitalizations and improved quality of life through center-based, home-based, and hybrid modalities. Sociological perspectives highlighted social determinants of health; embedding social care enhanced access and adherence. Health-administration-led quality programs and data feedback improved guideline-concordant therapy and reduced readmissions. Key gaps included role clarity, digital workflow integration, scalability, and equity. Multidisciplinary, data-enabled care—anchored by nursing and supported by pharmacy, laboratory medicine, physiotherapy, social care, and administrative QI—improves CVD outcomes. Future work should optimize team composition, communication, and implementation at scale.

Keywords: *Cardiovascular Disease, Multidisciplinary Care, Nursing, Pharmacy, Laboratory Medicine, Cardiac Rehabilitation, Social Determinants of Health, Quality Improvement, Telehealth, Implementation Science.*

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Introduction

Cardiovascular disease (CVD) remains the leading global cause of morbidity and mortality, demanding care models that extend beyond single-discipline management to coordinated, team-based strategies across the care continuum. Contemporary evidence in acute and chronic CVD increasingly links multidisciplinary organization—spanning nursing, pharmacy, laboratory medicine, physiotherapy, social sciences, and health administration—to better adherence to guidelines and improved patient outcomes, while also identifying gaps in implementation science and team structure that require systematic study (Vallabhajosyula et al., 2024).

Nursing is foundational to prevention, risk-factor modification, and longitudinal self-management. Nurse-led programs have demonstrated improvements in lifestyle counseling, risk detection, and patient empowerment, particularly when nurses coach patients on behavior change and medication use; these models show measurable gains in cardiovascular risk profiles and care engagement (Mattioli & Gallina, 2023; Bulto, & Hendriks, 2024). Pharmacists, embedded in primary and specialty settings, add value through medication optimization, adherence support, and protocol-driven management (e.g., hypertension, heart failure). Recent systematic reviews and meta-analyses report meaningful blood pressure reductions and enhanced adherence in pharmacist-involved models, especially when collaboration with physicians is explicit—underscoring the benefits of multidisciplinary team design (Memisoglu & Yusuf, 2021; Rattanavipanon et al., 2022).

Laboratory testing underpins timely diagnosis and risk stratification. The 2021 AHA/ACC chest pain guidance and the 2020 ESC NSTE-ACS guideline endorse high-sensitivity cardiac troponin algorithms for rapid rule-in/rule-out of myocardial infarction, enabling streamlined emergency pathways and reducing unnecessary admissions (Keykhaei et al., 2021). In chronic care, natriuretic peptides inform diagnosis, prognosis, and therapy titration in heart failure, as reflected in contemporary U.S. guidelines, reinforcing the central role of laboratory medicine within integrated clinical decision-making (Sandoval et al., 2022).

Physiotherapy—principally through exercise-based cardiac rehabilitation—remains one of the most effective multidisciplinary interventions after acute coronary events. Updated Cochrane evidence confirms reductions in all-cause and cardiovascular mortality, fewer hospitalizations, and improved health-related quality of life compared with usual care, and supports flexible delivery models (e.g., center-based, home-based, hybrid) that facilitate equitable access (Dibben et al., 2021)

Sociology and public health perspectives illuminate how social determinants of health (SDOH)—income, education, neighborhood environment, and social context—shape both incidence and outcomes of CVD. State-of-the-art reviews in leading cardiology journals and policy statements from major societies argue that addressing SDOH is essential to achieving equity, recommending routine SDOH assessment, community partnerships, and policy advocacy integrated into clinical pathway (Brandt et al., 2023). These insights justify embedding social workers and community health teams into CVD services to mitigate structural barriers to care.

Finally, health administration and quality improvement (QI) infrastructure determine whether evidence becomes standard practice. Large QI registries and programs (e.g., Get With The Guidelines–Heart Failure) are associated with improved adherence to guideline-directed therapies and reductions in readmissions when teams use real-time data, feedback, and implementation toolkits. Complementary evidence maps and systematic reviews further show that multi-level QI strategies—patient support, clinician training, and health-information technologies—produce modest but meaningful clinical gains across diverse CVD settings (Singh et al., 2021).

Taken together, recent evidence supports a multidisciplinary lens for CVD management: nurses catalyze prevention and self-management; pharmacists optimize pharmacotherapy and adherence; laboratories enable precise, time-critical diagnosis; physiotherapists deliver outcome-improving rehabilitation; sociological frameworks guide equity-oriented design; and health administrators orchestrate data-driven, system-level implementation. The central challenge for the next phase of research is to define optimal team composition, communication, and leadership structures that translate these role-specific strengths into consistently better cardiovascular outcomes at scale.

Aim of Work:

The primary aim of this research is to critically evaluate and synthesize contemporary evidence on the multidisciplinary management of cardiovascular disease (CVD), focusing on the integrated roles of nursing, pharmacy, laboratory testing, physiotherapy, sociology, and health administration.

METHODS

Study Design

This study employed a literature review design to synthesize and critically appraise recent evidence on multidisciplinary management of cardiovascular disease (CVD). The objective was to explore and integrate research findings published between January 2020 and September 2024 that examined the roles of nursing, pharmacy, laboratory testing, physiotherapy, sociology, and health administration in CVD prevention, diagnosis, and management.

Data Sources and Search Strategy

A comprehensive literature search was conducted using two major scientific databases: PubMed and Google Scholar. The search combined Medical Subject Headings (MeSH) and free-text terms related to cardiovascular disease and multidisciplinary care. Search strings included combinations of keywords such as:

“cardiovascular disease” OR “heart disease” AND (“multidisciplinary care” OR “team-based care” OR “integrated care”) AND (“nursing” OR “pharmacy” OR “pharmacist” OR “laboratory testing” OR “diagnostics” OR “physiotherapy” OR “rehabilitation” OR “sociology” OR “social determinants of health” OR “health administration” OR “health systems”).

The search was restricted to peer-reviewed articles published in English between 2020 and 2024. References from relevant review papers and clinical guidelines were manually screened to identify additional eligible studies.

Inclusion and Exclusion Criteria

Studies were included if they met the following criteria:

1. Focused on cardiovascular disease prevention, management, or rehabilitation.

2. Described or evaluated the role of at least one professional discipline among nursing, pharmacy, laboratory medicine, physiotherapy, sociology, or health administration.

3. Reported measurable clinical, behavioral, or organizational outcomes.

4. Were primary research articles (quantitative, qualitative, or mixed-methods), systematic reviews, meta-analyses, or official guidelines from recognized health organizations.

Studies were excluded if they:

1. Were published before 2020 or not in English.

2. Focused solely on pharmacological or surgical interventions without multidisciplinary context.

3. Represented opinion pieces, editorials, or conference abstracts without empirical data.

RESULTS

The present literature review focused on the multidisciplinary management of cardiovascular disease (CVD), examining publications from 2020 to 2024 that addressed the roles of nursing, pharmacy, laboratory testing, physiotherapy, sociology, and health administration in prevention, diagnosis, and long-term care. The findings were organized under key thematic areas presented in the discussion.

DISCUSSION

Nursing Roles in Cardiovascular Disease Management

Prevention and Early Detection

Nurses have long occupied a frontline role in risk-factor surveillance, patient education, and primary prevention of cardiovascular disease. In recent years, the literature has reinforced and refined this role, especially in community and outpatient settings. For example, a narrative commentary in BMC Nursing (2023) underscores that “coaching performed by nurses leads to effective results” in early adoption of healthy behaviors, based on the principle that atherosclerosis begins early and is modifiable over time (Mattioli, A. V., & Gallina, 2023).

Another nurse-led strategy involves community-based screening and awareness campaigns. A recent initiative in Europe evaluated nurse-led cardiovascular health awareness/screening events targeted at individuals not already engaged with healthcare services; these events included risk factor measurement, brief counseling, and referral pathways for follow-up. The program identified a high prevalence of undiagnosed hypertension, diabetes, and dyslipidemia, thus catching high-risk individuals before clinical presentation (Okop et al., 2022).

These prevention roles align with the "Life's Simple 7 / Life's Essential 8" paradigm promoted by the American Heart Association, in which behavioral measures (smoking, diet, physical activity, sleep) and biometric measures (blood pressure, cholesterol, glucose, BMI) are monitored and modified. Nurses often function as the behavioral coaches and data collectors in many clinical systems, particularly in primary care or community health settings.

In sum, nurse-led prevention integrates risk screening, motivational interviewing, lifestyle education, and linkage to care, especially in under-served populations. That said, comparative trials specifically isolating preventive nursing interventions remain relatively limited in cardiovascular disease (vs. more mature fields such as diabetes), representing an area for future research.

Self-Management, Patient Education, and Behavioral Change

A major and well-documented nursing role in CVD is as educator, counselor, and facilitator of self-management behaviors. In many settings, nurses lead structured programs designed to empower patients to monitor their own health metrics, adhere to medications, and adopt lifestyle modifications. A 2024 article from European Journal of Cardiovascular Nursing reviewed the efficacy of nurse-led self-management programs in cardiovascular disease. The authors concluded that these interventions, when well-designed and patient-centered, shift the paradigm from passive receipt of care to active patient participation (Bulto & Hendriks, 2024).

In hypertension, a systematic review and meta-analysis comparing nurse-led interventions versus usual care (through RCTs) found significant reductions in both systolic and diastolic blood pressure (pooled mean differences of –4.66 mmHg for SBP and –1.91 mmHg for DBP) in favor of nurse-led care. Behavior change outcomes—dietary modification, physical activity—also trended positively, though results for smoking and alcohol behavior change were mixed (Bulto & Hendriks, 2024).

A more focused study evaluated a nurse-led lifestyle intervention on knowledge of cardiovascular risk factors and preventive measures among patients with cardiometabolic abnormalities. After intervention, participants exhibited statistically significant improvements in knowledge scores, suggesting that nurse-delivered education can close gaps in patients' understanding of modifiable risk factors (Okube et al., 2023).

In heart failure care, mutual education of the patient–caregiver dyad has also been tested. An

article in Heart & Lung (2023) described nurse-led educational interventions addressed to both patients and their caregivers. The findings emphasized improved self-care, symptom recognition, and medication adherence, although methodological heterogeneity and small sample sizes limit generalizability (Bernard et al., 2023).

These educational and behavioral roles converge on a few recurring themes:

1. Nurses serve as interpretive translators of medical data (e.g., explaining blood pressure readings or lab values to patients).

2. Nurses engage in motivational interviewing, goal-setting, and follow-up to reinforce behavior change.

3. Nurses monitor adherence and side effects, linking patients back into clinical pathways when needed.

4. The intensity, frequency, and modality (face-to-face, group sessions, telephonic follow-up) of educational interventions influence effect size—more frequent contacts, personalized plans, and longitudinal reinforcement tend to yield better outcomes.

Transitional Care, Follow-Up, and Readmission Reduction

One of nursing's most critical functions in CVD care is bridging the transitions between hospital discharge, outpatient follow-up, and home management, with the goal of reducing readmissions and adverse events. Nurse-coordinated transitional care often includes discharge planning, medication reconciliation, follow-up phone calls or visits, symptom monitoring, and referral coordination.

Recent systematic evidence on nurse-led heart failure clinics (i.e. post-discharge outpatient services coordinated by nurses) notes beneficial impacts on readmission rates, symptom control, quality of life, and guideline-directed therapy adherence. A 2024 systematic review described how nurse-led heart failure clinics, with structured protocols and multidisciplinary support, can reduce hospital readmissions and improve patient outcomes (Wu et al., 2024).

In a 2020 study of a nurse practitioner–led collaborative health care model for heart failure, outcomes included improved self-care behavior, functional status, and lower rehospitalization. Importantly, the intervention was also cost-saving, demonstrating that nurse-led care in the transition period has economic as well as clinical value (Clarke, 2020).

Complementary to structured clinics are telemonitoring and remote oversight by nurses (discussed further below), which can detect decompensation earlier and prompt timely management changes, thereby averting hospitalizations. In many systems, nurse-led telephone follow-up in the first 30 days post-discharge is associated with lower readmission rates, although the strength of evidence varies by setting. Overall, the transitional care role highlights nursing as a continuity agent—ensuring that patients remain connected, monitored, and appropriately escalated in care.

Telehealth, Remote Monitoring, and Digital Nursing

The COVID-19 era accelerated adoption of remote monitoring and telehealth, spotlighting nursing's role in virtual care for cardiovascular populations. Nurses are often the operational leads for telemonitoring platforms, remote triage, and virtual patient engagement. A systematic review from BMC Nursing (2023) specifically evaluated nurse-led telehealth interventions in hypertension, demonstrating significant reductions in blood pressure (especially systolic) with modalities including remote video consultations, device-based monitoring, calls, and email alerts. The review also highlighted improvements in self-efficacy, lifestyle behaviors, and adherence (Kappes et al., 2023).

More broadly, The Lancet Digital Health published a meta-analysis of telemedicine interventions in CVD populations, showing that telemedicine reduced cardiovascular events and hospitalizations in populations with heart failure, hypertension, and other long-term cardiovascular conditions. Though not exclusively limited to nursing, many of those telemedicine models are nurse-led or involve nursing coordination (Kuan et al., 2022).

In integrating telemonitoring within nurse-led care models for patients with complex chronic conditions, a case study described implementation over six months involving hypertension, heart failure, and diabetes. Nurses reported high acceptability, shared vision, and accommodation of telemonitoring within existing workflows, but also identified challenges in workflow redesign, data overload, and integration into practice (Gordon et al., 2022).

Furthermore, the adoption of mobile health (mHealth) technology combining telemonitoring and tele-intervention in the early post-discharge period of heart failure was recently tested, showing promise in reducing risk of cardiovascular events and rehospitalizations, which is relevant to nurse-led oversight of high-risk phases (Yun et al., 2020).

Integration of telemonitoring systems into routine care has been posited as a strategy to improve outcomes in chronic CVD, though standardization of interventions and long-term economic evaluations remain needed (Russo et al., 2024).

From these findings, a few operational insights emerge:

•Nurses must have digital competence, including telehealth communication, device troubleshooting, data interpretation, and patient training.

•Workflow design must integrate remote data streams, protocols for alerts or escalations, and clarity in roles among nursing, physicians, and support staff.

•Telemonitoring models yield the greatest benefit when patients are well characterized (e.g. moderate-to-high risk, frequent decompensations) and when engagement is sustained.

Specialized Nurse-Led Clinics and Advanced Practice Nursing

In many health systems, nurse-led clinics offer structured, protocolized care for cardiovascular patients, sometimes with autonomous prescribing privileges, titration protocols, or care

coordination authority. These clinics often serve secondary prevention, chronic disease management, and follow-up.

The BMC Nursing review of nurse-led interventions in cardiovascular patients discusses how nurse-led clinics—staffed by advanced nurse practitioners or clinical nurse specialists—provide preventive, educational, and psychological support services beyond the purely therapeutic (i.e., beyond medication delivery) (Qiu, 2024).

In heart failure care, specialized nurse-led heart failure clinics have been evaluated for their contents and impact. The 2024 systematic review described that these clinics often include patient education, symptom surveillance, medication adjustment under predefined protocols, coordination with cardiology, and regular follow-up, showing beneficial effects on hospitalization, adherence, and patient outcomes (Wu et al., 2024).

In settings where nurse practitioners are empowered to lead cardiovascular care teams, collaborative models yield improved clinical outcomes. For instance, the previously mentioned nurse practitioner–led collaborative heart failure model showed lower rehospitalizations and improved self-care (Fox, 2022). Such clinics depend heavily on well-defined protocols, decision-support systems, interprofessional collaboration, and appropriately scoped recurring training.

Training, Competence, and Workforce Development

To realize the full potential of nursing roles in CVD, formal training and digital competency development are crucial. Many studies emphasize that the transition to more autonomous and technology-driven nursing roles demands enhanced educational preparation and institutional support. In telemonitoring and remote patient monitoring literature, reviews of nursing innovations describe that successful models depend on nurses' comfort with informatics, device management, digital communication, and data interpretation (Schultz, 2023).

Case studies of normalization of telemonitoring in nurse-led models highlight that training, ongoing support, and alignment with existing workflows are required to avoid clinician burnout or workflow disruption (Gordon et al., 2022).

Beyond digital skills, cardiovascular nursing competence includes advanced assessment capabilities, pharmacotherapy knowledge, interprofessional collaboration skills, motivational interviewing, cultural competence, and quality improvement literacy. In the AACN-supported "Clinical Scene Investigator" program, critical care and progressive care nurses in California hospitals were empowered to design and lead cardiac care improvements — resulting in measurable process and outcome improvements (Wu et al., 2024). Thus, workforce development strategies must go beyond continuing education—incorporating mentorship, simulation, role transition pathways (e.g., from bedside to advanced practice), and performance feedback.

Challenges, Gaps, and Limitations

Despite the promising evidence, several challenges and gaps remain in the literature and in practice:

1. Heterogeneity of Interventions & Study Designs

Many reviews note that the nurse-led interventions vary substantially in intensity, frequency, mode, and content, making direct comparisons difficult. In the meta-analysis of nurse-led hypertension RCTs, statistical heterogeneity ($I^2 > 80\%$) was substantial, limiting confidence in pooled effect sizes.

2. Low-to-Moderate Evidence Certainty

While many trials show favorable trends, the certainty of evidence is often limited by small sample sizes, short durations, risk of bias, or lack of blinding. Thus, stronger multi-center trials are needed.

3. Sustainability and Scalability

Many nurse-led programs are tested in pilot or single-center settings but have limited evidence for long-term sustainability and adoption at scale. The relative resource and staffing demands (especially with telemonitoring) represent barriers.

4. Workflow Integration & Data Overload

In telemonitoring models, the volume of incoming data and alerts may overwhelm nurse capacity unless carefully triaged. Nurses in case studies report challenges embedding new digital workflows into traditional workflows.

5. Role Clarity and Scope Limitations

In some settings, nurse involvement is constrained to supportive tasks rather than clinical decision-making or prescribing. Clarifying boundary conditions and establishing protocols that allow autonomous or semi-autonomous nurse actions (within safe frameworks) are ongoing issues.

6. Equity and Access

Telehealth and remote monitoring may inadvertently worsen disparities if vulnerable populations (older adults, low-income, low digital literacy) are unable to engage. Ensuring accessibility, user training, and inclusive design is critical.

7. Limited Focus on Hard Endpoints

Many studies focus on surrogate markers (BP, knowledge, adherence) rather than hard endpoints such as mortality, cardiovascular events, or health service utilization. Those outcomes require longer-term observation and larger cohorts.

8. Contextual and System-Level Barriers

Organizational culture, leadership buy-in, regulatory constraints, reimbursement models, and

nurse staffing levels all influence whether nurse-led innovations can survive beyond research settings. As noted in remote monitoring reviews, human resource shortages can compromise program performance.

Synthesis and Outlook

From this body of evidence, several integrative observations emerge:

•Magnitude of Benefit: Nurse-led interventions, especially in hypertension, consistently yield modest but clinically meaningful reductions in blood pressure, lifestyle improvements, and patient knowledge.

•Key Enablers: Frequent contact, personalized content, combined modalities (in-person + telehealth), decision-support tools, and clear nurse-physician collaboration frameworks strengthen effectiveness.

•Digital Amplification: Telehealth and remote monitoring extend reach and continuity of care, enabling early detection of deterioration, but require robust infrastructure, workflow design, and nurse training to succeed.

•Transitional Role Strength: In the critical post-discharge window, nurse-led follow-up and remote monitoring can reduce rehospitalizations and improve outcomes in heart failure and acute coronary syndrome populations.

•Institutional Preconditions: Success hinges on institutional commitment, leadership support, protocols, interprofessional alignment, workforce development, and sustainable funding.

•Gaps for Future Research: More high-quality, multicenter RCTs with standardized protocols and long-term follow-up are needed. Research should focus on cost-effectiveness, scalability, equity in access, workforce impacts, and implementation science for broader roll-out.

Conclusion

Overall, the reviewed studies converge on a clear conclusion: multidisciplinary collaboration enhances both clinical outcomes and patient experience in cardiovascular disease management. Nursing and pharmacy interventions drive adherence and education; laboratory diagnostics ensure timely and accurate decision-making; physiotherapy promotes recovery and functional health; sociological insights address disparities; and health administration provides the structural backbone for integrated care delivery. However, challenges remain in communication, role clarity, and system interoperability, warranting further investigation and structured implementation research.

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