

Nursing and medical care of child and adults with cardiopulmonary, glands and metabolism problem: a systematic review and meta-analysis

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ABSTRACT

Background and Rationale

Heart disease is the leading cause of death worldwide. The goal of current study was to evaluate nursing and medical care of child and adults with cardiovascular disease.

Methods

48 articles published until 2024 were reviewed with keywords including “Cardiopulmonary»,»Nursing»,» Medical Staff»,»Reconstructive Surgery» in PubMed, Web of Science, Scopus, Science Direct, Elsevier and Wiley.

Results and Conclusion

The results showed mean differences of cardiovascular risk score before and after nursing intervention declined 2.35 points (MD: -2.35 95% CI; -2.49, -2.20; p<0.01). Changes in the patient’s lifestyle can include smoking cessation, healthy diet, regular physical activity, weight control, blood pressure control, cholesterol and blood sugar control.

Keywords

Medical care, lifestyle, cardiovascular disease, nursing intervention, routine care

INTRODUCTION

Cardiopulmonary disease refers to a variety of serious disorders that impact both the heart and the lungs.¹ While the global incidence of cardiac arrests in hospitals remains largely unreported, the United States reportedly has some of the highest occurrences. In the U.S., there are approximately nine to ten cardiac arrests for every 1,000 hospital admissions. Prior to surgery, patients receive a medical evaluation to determine the risks and advantages associated with the procedure.² Typically, patients who are undergoing surgery need to fulfill certain criteria, one of which is hemodynamic stability.

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As a result, instances of cardiopulmonary arrest can often be surprising. Gaining insight into the patient's medical background and current health status, along with any existing comorbidities, is crucial for delivering safe, high-quality care and effectively managing any necessary sedation based on the procedure. It is important to take into account the patient's medical history regarding lung, kidney, heart, and endocrine disorders..³⁻⁵

Nursing and medical professionals must be prepared to manage life-threatening emergencies. They are required to take action to ensure the highest quality of care for their patients. Prompt diagnosis, seeking help, and swift intervention are the main responsibilities of nurses. Although they play a vital role in fulfilling these responsibilities, both nurses and doctors often report feeling unsure about providing critical life support..^{3, 6-7}

Timely and suitable interventions are the key factors that predict patient survival; therefore, it is essential for nurses and other healthcare providers to feel equipped to act when patients' conditions deteriorate..⁸⁻⁹

The current research was designed to assess the nursing and medical care provided to children and adults experiencing issues related to cardiopulmonary function, glands, and metabolism.

METHODS

The current study used international databases such as Cochrane, Embase, and MEDLINE (PubMed and Ovid) to conduct an electronic search for papers on the nursing and medical care of child and adults with cardiopulmonary, glands and metabolism problem. All relevant articles published up to 2024 were searched.

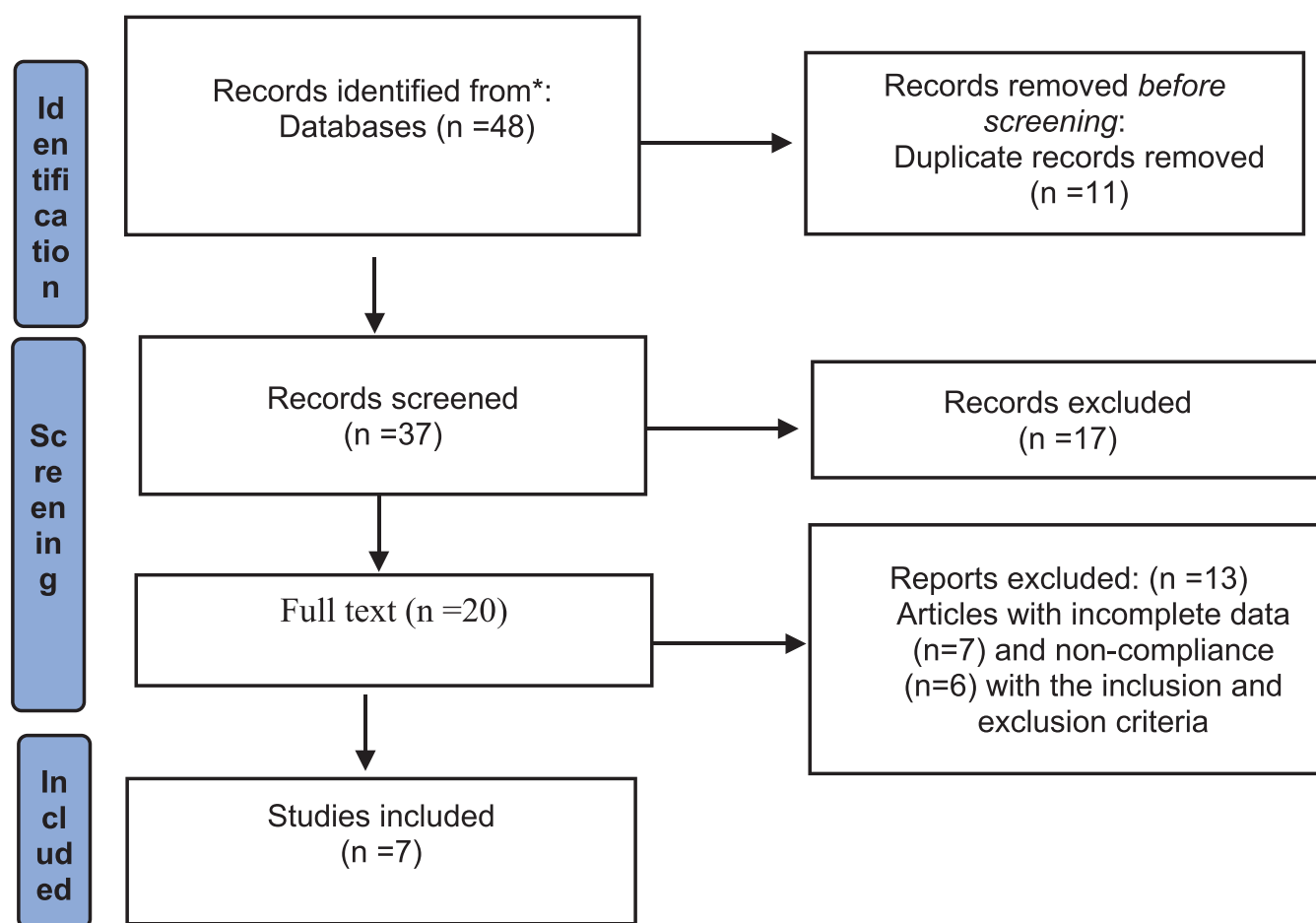


Figure 1. Flow PRISMA 2020 of included subjects

Using the following keywords: “Cardiopulmonary», «Nursing intervention»,» Medical Staff»,» cardiovascular disease» and « lifestyle».

Selection criteria

1. Only studies published in English were considered.
2. Population (P): child and adults with cardiopulmonary or cardiovascular disease
3. Intervention (I): lifestyle interventions
4. comparison (C): usual-care
5. Outcome (O): Effectiveness of interventions

Studies have been conducted in a review, laboratory and animal form; books; qualitative studies; Studies with incomplete data and case report studies were excluded from the study.

Mean differences used as an effect size with fixed-effects model and inverse-variance methods of 95% confidence intervals (CI). Meta-analysis performed using Stata (as of version 17). Statistical significance was considered less than 0.05.

RESULTS

The initial search identified 48 articles. In the first phase, 11 articles were eliminated due to duplicate records based on article titles. Studies that did not meet the inclusion criteria were excluded by reviewing the abstracts of 37 articles in the second step (n = 17). In the third step, 8 articles with incomplete data or non-compliance with the inclusion and exclusion criteria were eliminated after examining the full texts of 20 articles. Ultimately, seven articles were included in the present study (Table 1).

Study characteristics

861 patients (287 female and 574 male; mean age: 57.45 years) in intervention group and 850 patients (270 female and 580 male; mean age: 57.51 years) of seven randomized controlled trial studies included in present study (Table 1).

Table 1. Sample profile of included studies.

Study. Years	Study design	number of patients		Mean age		Gender			
						Intervention		Control	
		Intervention	Control	Intervention	Control	female	male	female	Male
Ritngam et al., 2024 ¹⁰	RCT	30	30	40	40	2	28	5	25
Zheng et al., 2020 ¹¹	RCT	86	87	55.2	56.1	46	40	42	45
Minneboo et al., 2017 ¹²	RCT	360	351	58.2	59.2	77	283	72	279
Zhang et al., 2017 ¹³	RCT	100	99	66	65	50	50	42	57
Van den Wijngaart et al., 2015 ¹⁴	RCT	147	147	65	65	52	95	51	96
Cicolini et al., 2014 ¹⁵	RCT	100	100	59.8	58.3	50	50	49	50
Saffi et al., 2014 ¹⁶	RCT	38	36	58	59	10	28	9	27

RCT: randomized controlled trial

Mean differences of systolic blood pressure between the intervention and control groups revealed a significant difference (MD: -6.15 95% CI: -8.34, -3.97; $p < 0.01$) (Figure 2) and mean differences of diastolic blood pressure between the intervention and control groups revealed a significant difference (MD: -4.20 95% CI: -5.18, -3.23; $p < 0.01$) (Figure 3).

The mean differences of cardiovascular risk score before and after nursing intervention in intervention group declined 2.35 points (MD: -2.35 95% CI: -2.49, -2.20; $p < 0.01$) (Figure 4). The mean differences of cardiovascular risk score after nursing intervention between intervention and control groups declined 3.02 points (MD: -3.02 95% CI: -3.17, -2.88; $p < 0.01$) (Figure 5).

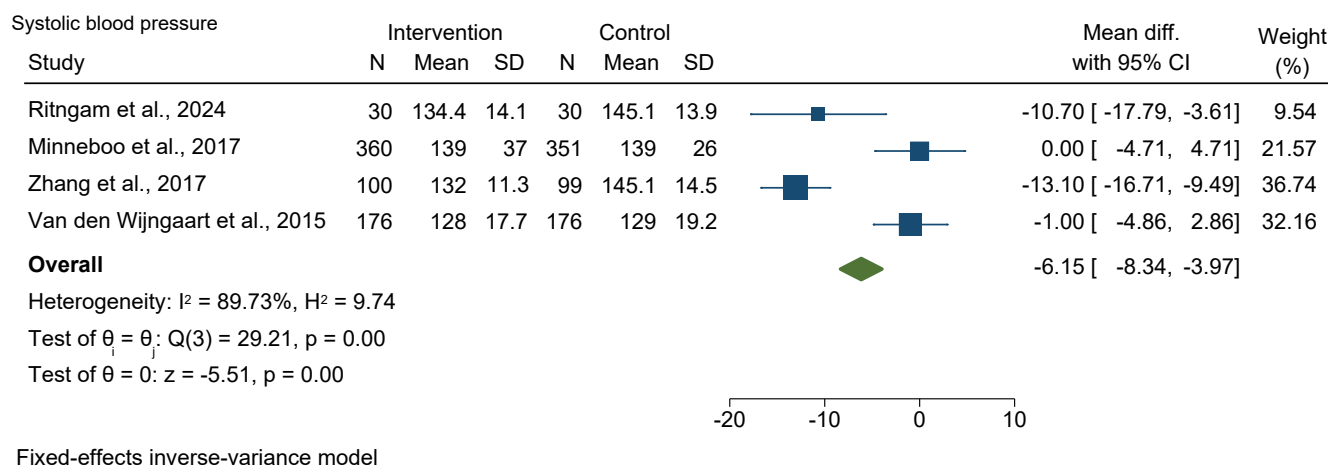


Figure 2. Forest plot of systolic blood pressure between the intervention and control groups

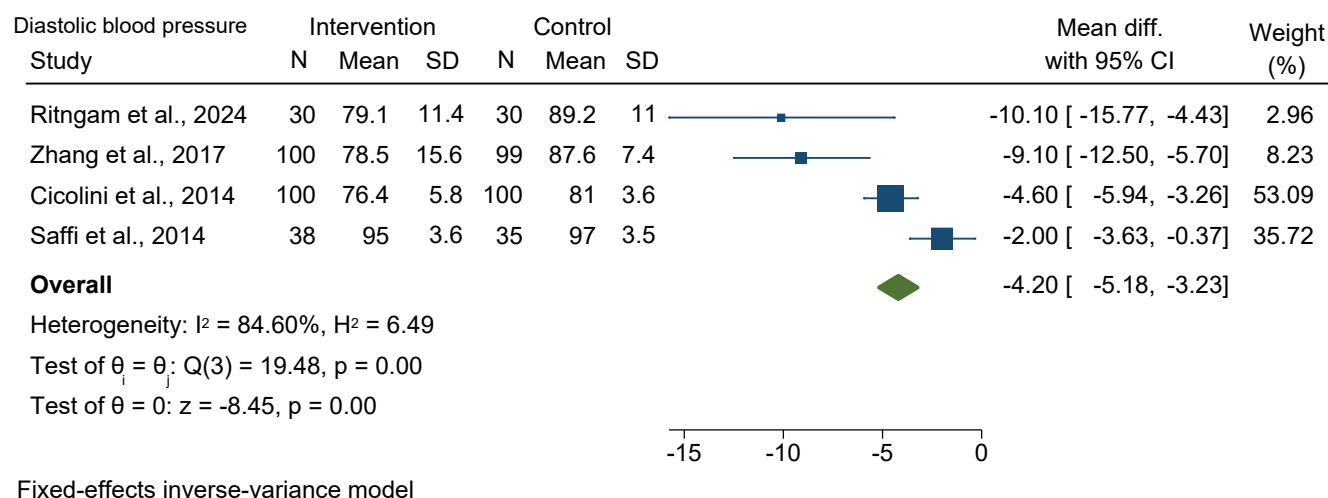


Figure 3. Forest plot of diastolic blood pressure between the intervention and control groups

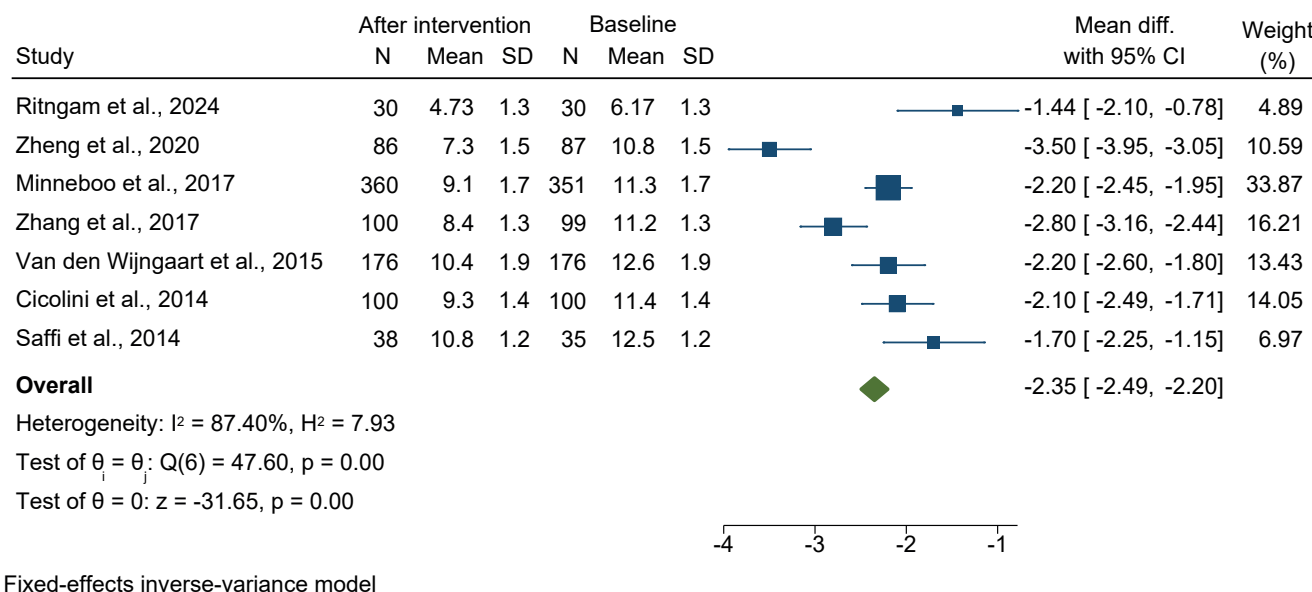


Figure 4. Forest plot of Cardiovascular risk score in intervention group.

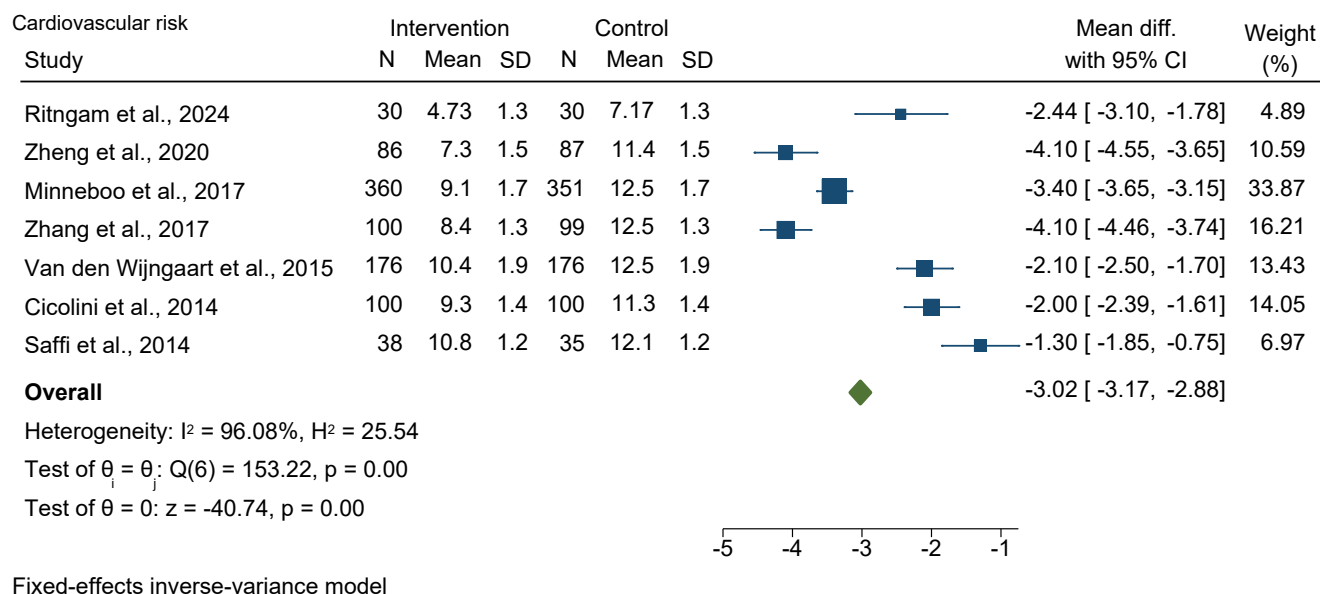


Figure 5. Forest plot of Cardiovascular risk score between intervention and control groups

DISCUSSION

Possessing an unhealthy heart or lungs can result in various other issues. Complications arising from cardiovascular disease or chronic obstructive pulmonary disease can include heart failure, heart attack, stroke, aneurysm, sudden cardiac arrest, peripheral artery

disease, lung cancer, respiratory infections, elevated blood pressure in the pulmonary arteries, and additional heart-related problems.

The current meta-analysis indicated that the cardiovascular risk score was reduced by -3.02 points in the group that received lifestyle counseling compared to

those given traditional medical advice. Additionally, the intervention group experienced notable enhancements in metrics like systolic and diastolic blood pressure. A lifestyle counseling program led by nurses demonstrated a greater improvement in estimated cardiovascular risk than traditional medical advice. Self-management plays a crucial role in delivering personalized behavioral counseling to patients at risk of cardiopulmonary disease. This counseling aims to assist individuals in altering their harmful behaviors to minimize the chances of encountering detrimental effects associated with high-risk habits. The nurse-led health promotion initiative at the workplace improved participants' knowledge of managing blood pressure and provided tailored behavioral counseling, helping them embrace healthier habits. This approach demonstrates the importance of interventions at the organizational level, health education, and self-management in achieving improved blood pressure regulation.¹⁷⁻¹⁹

The extensive role of nurses in evaluation, advising, teaching, and providing support is crucial for reaching these results. Research indicates that programs led by nurses can significantly lower cardiovascular risk factors.²⁰⁻²¹

The overall cardiovascular disease risk score for the intervention group dropped significantly, owing to decreases in both systolic and diastolic blood pressure. Addressing these key risk factors lowers the likelihood of developing cardiovascular disease. These findings align with a systematic review indicating that lifestyle modifications effectively enhance two crucial risk factors for cardiovascular disease: systolic and diastolic blood pressure.²² A recent study indicates that a lifestyle change program offered in primary care can significantly reduce the risk of cardiovascular disease in adults at high risk and enhance cardiovascular risk factors.²³

A lifestyle intervention led by nurses is crucial for health promotion initiatives since nurses play a vital role in assessing, advising, educating, supervising,

coordinating, and championing individuals' health, particularly among high-risk populations. These responsibilities are key to reducing the likelihood of heart disease.

CONCLUSION

Present results showed that lifestyle nursing interventions can reduce cardiovascular disease risks. Changes in the patient's lifestyle can include smoking cessation, healthy diet, regular physical activity, weight control, blood pressure control, cholesterol and blood sugar control. Some factors such as stress, anxiety and intense physical activity can aggravate the symptoms of heart disease. It is necessary for the cardiac patient to have a regular sleep schedule and to provide a suitable environment for the cardiac patient to have enough and peaceful sleep. Also, weight loss has been used in obese people using lifestyle changes, drug therapy, and bariatric surgeries, and various results have been reported in connection with it. Despite these contradictions, planned weight loss is still accepted and recommended by most scientific communities, especially by changing lifestyle and increasing the amount of physical activity due to the reduction of complications caused by obesity such as blood pressure and dyslipidemia.

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Authors' contribution:

Data gathering and idea owner of this study: MAF, HD

Study design: MAF, SGS, FC, AK, PH, HD

Data gathering: MAF, SGS, FC, AK, PH, HD

Writing and submitting manuscript: MAF, HD

Editing and approval of final draft: MAF, SGS, FC, AK, PH, HD

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