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Review

Impact of Nursing Care in Comorbid Patients with Cardiovascular Diseases

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Abstract

As living standards continue to rise, an increasing number of people face various physical health issues, with high-risk cardiovascular diseases (CVDs) being among the most prevalent. Effectively improving treatment and accelerating recovery in cardiac patients has become a social issue. A number of studies have proven that the significant social and economic changes in our society affect personal health. So, they lead to development of various concomitant chronic diseases. The main CVDs risk factors include: high blood pressure, lipid metabolism disorders, excessive alcohol consumption, smoking, obesity, diabetes mellitus, low physical activity, psycho-emotional stress, unhealthy diet and others. The risk of developing ischemic heart disease (IHD) can be greatly lowered by reducing or eliminating the impact of certain risk factors. We need coordinated efforts, while providing inpatient and outpatient care, to educate and encourage the patient to change to a healthier lifestyle. An important task of cardiac nurses is to act preventively in the long term. They need resources, skills and knowledge to effectively lead patient health education. Beyond their specialized expertise in cardiovascular care, they must apply evidence-based practices and provide personalized treatment. Strong communication, effective information sharing, and patient education are fundamental to successful preventive cardiology.

Keywords: Cardiovascular Diseases (CVDs), Comorbid patients, Impact, Nurse, Nursing care

INTRODUCTION

Although there has been a remarkable decrease in cardiovascular mortality rates among specific age groups in Western nations in recent decades, CVDs still occupy the first place in mortality worldwide. (Capewell et al., 2011). The reduction in cardiovascular events and mortality rates can be attributed to improvements in primary prevention and the pharmacological management of cardiovascular risk factors. (Capewell et al., 2011; O'Flaherty et al., 2013). Consequently, the age at which individuals experience their first cardiovascular event has risen, and patients are living longer following the onset of cardiovascular diseases. (Koopman et al., 2016).As a result, a growing number of CVD patients are living longer and are more likely to develop comorbid conditions, making this group particularly significant in comorbidity research. Comorbidity refers to the existence of one or more additional chronic diseases alongside the primary condition (Feinstein, 1967). Comorbidity can result in worsened functional status, reduced quality of life, and even a higher risk of mortality (Barnett et al., 2012; Vos et al., 2015). The presence of multiple chronic diseases not only affects patients but also presents a challenge for healthcare systems, especially primary care, which have typically been organized to treat single conditions. This fragmented approach can lead to contradictory medical advice and potential drug interactions. (Boyd et al., 2005). Today, comorbidity is increasingly seen as the norm rather than the exception. Therefore, raising awareness and enhancing guidelines for managing patients with comorbid conditions are

essential for preventing negative health outcomes, improving efficiency, and reducing costs.Evaluating the prevalence of CVD comorbidity and establish a foundation for future research is a crucial first step in this process.Although the significant number of individuals with complicated healthcare requirements and recognized impact they have on health care, no current research indicates the prevalence of different combi-nations of comorbid conditions by gender and age. In addition, most studies examine two diseases at most, while CVD patients often have more than two comorbid conditions (Barnett et al., 2012; Wong et al., 2011; McMannus et al., Chamberlain et al., 2015).

Research in this area demonstrates that patients experience less discomfort during their hospital stay, both before and after invasive cardiac procedures, thanks to the comprehensive information and support provided by the nurse. Nurses play such a key role in supporting patients during their hospital stay. By assessing their needs, checking their understanding, and offering helpful educational resources, nurses empower patients. This not only helps reduce discomfort during hospitalization but also improves their quality of life afterward. It's amazing how much of an impact a little guidance and support can make (Kleisari et al., 2021).

CVDs account for a major proportion of diseases in the elderly population worldwide and have been a mortality leading cause in recent decades. The most prevalent forms of cardiovascular disease are ischemic heart disease (IHD), cerebrovascular disease and hypertension. Myocardial infarction (MI) is one of the most severe IHD clinical forms. It is the primary cause of mortality and disability worldwide. MI is ischemic necrosis, loss of a section of heart muscle tissue due to insufficient blood and oxygen supply. It has great social importance because of the high disability and mortality it causes.

A heart attack, or myocardial infarction, occurs when a blood clot suddenly blocks a coronary artery, cutting off blood flow to a portion of the heart muscle, leading to its damage or death. Coronary arteries are responsible for delivering oxygen and nutrients to the heart muscle. When these arteries become blocked, the heart muscle is deprived of oxygen and blood, leading to cardiac ischemia, which causes chest pain and pressure. If circulation is not restored within 20 to 40 minutes, the damage to the heart muscle becomes permanent. Cardiac tissue continues to deteriorate over the next 6 to 8 hours, and after that point cardiac necrosis is usually complete. MIis a major contributor to mortality and disability on a global scale. Coronary atherosclerosis is a long-term condition characterized by alternating stable and unstable phases. During unstable periods, as a result of an activated inflammatory process in the blood vessel wall, patients may experience MI.

Heart attack is usually observed in the active adult age (40-65 years), but in the last decade, due to an increase in its frequency, it is established and becomes more frequent at a younger age. In terms of morbidity and Stoyanova et al. 269 gender-specific incidence, up to about 55-60 years of age, the male gender predominates. MI may be the result of a persistent lifelong condition, in some cases it remains silent and unnoticed, while for others, it can escalate into a critical emergency, causing sudden death or severe circulatory failure.

The incidence of this disease has increased in recent years and is a major social problem. Bulgaria ranks first in the number of heart attack patients. It mostly affects people around 45 to 65 years of age, but it can also significantly affect younger people. It leads to early disability and high mortality (Tomov, 1999; Tomov, 2003).

Research Area

Thanks to the work of the World Health Organization (WHO) and international scientific societies, considerable experience has been gained in prevention and approaches to dealing with CVD. Several large projects related to risk factors and cardiac prevention have been implemented in Europe: INTERHEART, EUROASPIRE I, II, III, IV, V; EUROACTION; MONICA etc. (Kotseva et al., 2009; Kotseva et al., 2018; McGorrian et al., 2011; Wood et al., 2004).

Nurses, as well as other health professionals: rehabilitators, physiotherapists, nutritionists, psycho-logists, can carry out activities contributing to the successful prevention of cardiovascular diseases. They can provide health information, educate patients and their families about the principles of a healthy lifestyle and motivate them to actively cooperate in order to improve health and quality of life (Jennings et al., 2017; Olisarova et al., 2019).

Results from the international European program EUROASPIRE (European Action on Secondary and Primary Prevention by Intervention to Reduce Events) for prevention of cardiovascular risk show that regardless of the large number of medications for the prevention of CVD in both primary and secondary cases, patients with or without IHD history do not reach target values for risk factors. The study was performed four times in the period 1997-2013, with 24 participating European countries, including Bulgaria. There is cumulative evidence on lifestyle, risk factors, and therapeutic outcomes of CVD patients and high-risk individuals receiving standardized treatment. The results are worrying, no trends for reducing risk factors have been established. More than half of the examined patients (56%) in the three stages of the EUROASPIRE study with proven IHD had arterial pressure values above the desired values, and only 55% of those treated for dyslipidemia, maintained lipid levels below the target values. More than 1/3 of IHD patients also have diabetes mellitus, and only 10% of them manage to control blood sugar below 6.1 mmol/L. A very

important conclusion was made: more and more drugs are prescribed for the treatment of hypertension and dyslipidemia, but effective measures are not applied to control the problems related to risk factors and unhealthy lifestyle (Kotseva et al., 2009; Kotseva et al., 2018).

At the same time, data from other studies support the conclusion that CVDs prevention is economically, socially, and humanely superior to any therapy. Researchers performed specific modeling to compare cardiovascular prevention with treatment in people aged 30 to 84 years who had different levels of risk, frequency of cardiac events, patterns of behavior, treatment, and mortality. They found that 44% of all deaths were due to heart diseases. Managing risk factors before an acute incident would prevent or delay 33% of deaths. In comparison, optimal medical treatment during an acute coronary event would reduce mortality by only 8% (Castellano et al., 2013; Nikolich-Zugich et al., 2016). Patients receiving traditional treatment showed poorer outcomes compared to patients using lifestyle change educational programs (OR 1.48 [95% CI, 1.17-1.88]). Prevention programs involving goal setting, selfmonitoring, action planning, and feedback have shown improved healthy eating and physical activity among participants. Other studies have also confirmed these findings demonstrating the benefits of lifestyle change education, leading to better clinical outcomes and quality of life (Janssen et al., 2013; Karmali et al., 2014).

In 2017, Frederiv et al. recommended the use of a comprehensive informational approach to CVDs prevention, including multiple components: risk assessment; counseling for physical activity and development of a training program; dietary nutrition counseling; control of risk conditions; psycho-social support and management; adherence to therapy; patient health education (2017). The challenge is motivating people to long-term adherence to positive lifestyle changes. Many patients report that they did not receive strong encouragement from doctors and other health professionals regarding prevention. The management of risk factors would have effective results with good motivation and appropriate health education. Good practices should be multiplied in health policies for all communities, with full participation of nurses and other specialists in multidisciplinary teams (Frederix et al., 2017).

Today, comorbidity is seen as the norm, not as an exception. Beyond its impact on individual patients, comorbidity also poses extra challenges for health care systems. Despite the large number of patients with CVDs and comorbidity and the recognition of their impact on health care, there is a lack of current evidence regarding the prevalence of various combinations and conditions of comorbidities varies between men and women and how it changes over time. Results from studies along these lines can help researchers in the area identify relevant subgroups, inform them which comorbid states are most common and may require prioritization, and allocate health care resources toward patients with more than one diseases.

The study by Buddeke et al. looked at two types of comorbidity: non-cardiovascular and cardiovascular (2019). The most prevalent non-cardiovascular conditions in the study were poor vision, back and neck problems, diabetes, chronic obstructive pulmonary disease (COPD), osteoarthritis, and cancer. These were also among the top five non-cardiovascular comorbidities across all CVD patient groups. In age- and gender-adjusted analyses, diabetes, COPD and poor vision were found to be significantly more prevalent in CVD patients compared to those without CVD. Additionally, asthma was also more commonly observed in CVD patients. In stroke patients, the occurrence for many of the comorbid conditions seemed slightly lower compared to other patient groups. Epilepsy, however, was more common in stroke patients. Osteoarthritis, on the other hand, was highly prevalent, affecting 32% of heart failure (HF) patients. When the musculoskeletal conditions (osteoarthritis, back/neck problems, rheumatoid arthritis and osteoporosis) were combined, the percentage rose to 52%. The occurrence of several non-cardiovascular comorbidities seemed to be highest in heart failure (HF) patients compared to those with other cardiovascular conditions.

HF patients most commonly experience IHD as a cardiovascular comorbidity, with a prevalence of 38%. Peripheral arterial disease (PAD) and stroke are also present in 25% and 19% of HF patients, respectively. On the other hand, among individuals with IHD, heart failure is the most frequently occurring cardiovascular comorbidity.After adjusting for age and sex, cardiovascular comorbidities were found to be more common in patients with CVD than in those without it. HF patients exhibited the highest rate of cardiovascular comorbidities, followed by those with PAD. Furthermore, 27% of HF patients had both cardiovascular and musculoskeletal conditions, compared to 18% of PAD patients, 16% of stroke patients, and 12% of those with IHD. (Buddeke et al., 2019).

Previous research has supported the observation that comorbid conditions are especially common among HF patients. (Chamberlain et al., 2015; van Oostrom et al., 2012; Sinnige et al., 2015; Buddeke et al., 2017). A separate study conducted in the Dutch population found that HF patients had the highest comorbidity prevalence at 92%, compared to 81% in stroke patients and 80% in those with IHD (van Oostrom et al., 2012) In addition, HF patients more often have simultaneously cardiovascular and noncardiovascular comorbidities. In the previous study, there was a significant number of HF cases observed in individuals who also have a cardiovascular comorbidity along with a musculoskeletal disorder, as well as in those with both a cardiovascular comorbidity and COPD and/or asthma.

Research on diseases with trinucleotide repeats are

less common than those examining dual diseases. Nevertheless, Sinnige et al. (2015) found comparable results, highlighting a significant prevalence of HF paired with coronary artery disease and COPD, as well as heart failure alongside coronary artery disease and osteoarthritis.

This supports earlier findings that conditions such as diabetes, poor vision, osteoarthritis, back/neck issues, cancer, and COPD are highly prevalent among CVD, stroke and HF patients (van Oostrom et al., 2012; Sinnige et al., 2015). These conditions are also the most frequently found in patients with PAD. Moreover, other health issues were identified as the leading non-cardiovascular comorbidities across various age groups, affecting both genders equally. However, musculoskeletal disorders were more common in women than in men, supported by previous literature (Buddeke et al., 2017, Marzolini et al., 2010; Foguet-Boreu et al., 2015).

In age- and sex- adjusted analyses, poor vision, asthma, COPD, and diabetes were found to be significantly more common in patients with cardiovascular conditions than in those without the corresponding CVD. The fact that these diseases share similar risk factors with cardiovascular conditions may explain their higher prevalence. Individuals with type 2 diabetes often have increased rates of "traditional" CVD risk factors like smoking, abdominal obesity, dyslipidemia, and a sedentary lifestyle. Additionally, diabetes may contribute to CVD through mechanisms such as chronic hypertension, sustained high blood sugar levels, micro-vascular complications, myocardial protein glycosylation, diabetic nephropathy, and autonomic neuropathy. (Shah et al., 2015).

Likewise, Similarly, CVD and COPD also have common risk factors, including smoking. COPD has also been suggested to be associated with HF due to the increased prevalence of COPD in HF patients that may be linked to chronic low-grade systemic inflammation (Hawkins et al., 2013). The poor vision was statistically significantly associated with CVD, consistent with previous studies (Christ et al., 2008; Loprinzi et al., 2015). Once again, the suggested explanation for this connection is that both conditions share common risk factors, such as smoking (Christ et al., 2008). In contrast, an earlier study demonstrated a significant relationship between visual impairment and the 10-year risk of a first atherosclerotic event, even after adjusting for traditional risk factors (Loprinzi et al., 2015). There may exist a pathologic link between CVD and visual impairment, which is yet unknown. There is also a strong link between epilepsy and stroke. This result aligns with earlier studies, which have shown that patients, especially those with intracerebral hemorrhage, are at a heightened risk of developing epilepsy(Beghi et al., 2011).

Patients with multiple coexisting conditions faced an increased risk of in-hospital mortality. According to Teng et al., there is still a lack of comprehensive understanding regarding the full range of MI comorbidities in the United States, especially when it comes to non-cardiovascular conditions (2020). The most recent national hospital sample database was used, and they identified 127730 individuals hospitalized with a diagnosis of MI. Using ICD-10 coding, Stoyanova et al. identified comorbid conditions across all secondary diagnoses. The most frequently observed were traditional cardiovascular diseases, with ischemic heart disease (61.61%) leading the list, followed by elevated lipid levels (58.62%), high blood pressure (53.97%), tobacco use (46.9%), type 2 diabetes (27.45%), and atrial fibrillation (19.7%). Additionally, a substantial presence of non-cardiovascular conditions was noted. Among the most prevalent were chronic kidney disease (39.68%), anemia (24.53%), gastroesophageal reflux disease (19.78%), acute kidney injury (19.12%), chronic obstructive pulmonary disease (13.2%), hypothyroidism (11.79%), anxiety disorders (9.94%), and depressive disorders (8.59%).

We can conclude from the last reviewed study that MI today is linked not only to traditional cardiovascular conditions but also to a significant presence of non-cardiovascular disorders, which have previously received limited systematic investigation. To improve the prognosis of acute MI, further research into these non-cardiovascular comorbidities is essential.

Recognizing the remaining gap between scientific standards and the real state of health care, a scientific team from Imperial College, UK is developing an innovative, multidisciplinary prevention program EURO-ACTION, coordinated by nurses, focused on families and applicable in pre-hospital and in-hospital care. The teams consisted of a coordinating nurse, nutritionist, physiotherapist, cardiologist, general practitioner, psychologist, pharmacist, etc. The main goal was to achieve a healthy lifestyle in families. 9062 patients and their families (2003-2006) participated in the study. The model has been implemented in eight European countries: England, France, Italy, Spain, Denmark, Switzerland, Holland, Poland. After one year, results show positive lifestyle changes and more effective risk factor management for participating patients and their families. The group subjected to training and monitoring by nurses showed better results regarding risk factors: smoking, healthy diet, lipid profile, blood pressure control (Kotseva et al., 2009; Kotseva et al., 2018).

The experience from EUROACTION was integrated into the national health system of England as a model for primary and secondary CVD prevention. At the same time, training of physicians, nurses and other specialists, members of the multidisciplinary teams, was carried out by creating a master's program in preventive cardiology. The study EUROACTION is an evidence-based model and recommended approach for health care across Europe (Kotseva et al., 2009).

In 2008, a new MYACTION model (Imperial College, UK) for community prevention was developed and

implemented. It supports general practitioners in referring high-risk patients to appropriate preventive programs. Such pilot programs have been implemented in several UK locations. A large proportion of project participants achieved the expected target results on modifiable risk factors. The teams reported an increase in the quality of preventive interventions in primary health care (Kotseva et al., 2009; Olisarova et al., 2019).

In 2017, according to Jennings et al., effective CVDprevention can be achieved through consolidated efforts of physicians, nurses, pharmacists, psychologists, nutritionists, and other health professionals. The most effective preventive care strategies are those that adopt a comprehensive approach to risk reduction (ie, encompassing all risk factors that affect the cardiovascular system), using counseling for the behaviorcombined with proactive interventions, along with goal-setting strategies; proven therapeutic interventions with follow-up face-to-face meetings or telephone support (2017).

Nurses are qualified to perform the following autonomous activities: to provide health information and guidance, to improve lifestyle and preventive medication, to ensure continuous patient monitoring and education. Motivating patients to adhere to therapy is the basis for positive treatment outcomes. A sufficiently effective approach is important for promotion of adherence to treatment. Good results have been achieved by sending informative telephone messages to patients. The use of an automated reminder system based on services from mobile operators is a promising approach to improve medication adherence in individuals at high risk for IHD and MI (McGorrian et al., 2011; Kolandaivelu et al., 2014; Riegel et al., 2013). Patient education methods include education through written materials, CDs, mobile phone applications and monitoring. Studies show increased knowledge, though no definitive results of better self-management skills are reported. A systematic review of33 interventions for socially significant diseases shows that knowledge is a necessary component of patient treatment, but not sufficient for effective health outcomes. Adequate self-management requires routine preventive action skills and decision-making skills in the face of deterioration. Patients report that they need practical skills to control symptoms (Beatty et al., 2013; Walters et al., 2012).

Martin et al. reported significant benefits of educating patients about self-management. A training program was used to deal with fear and anxiety, building trust in medical professionals, increasing knowledge about the disease, building skills for managing the chronic disease and dealing with accompanying mental and emotional problems. According to medical professionals, gaining control over the condition is an important goal to increase quality of life (Martin et al., 2009).

Educating patients is crucial for fostering their active participation in the treatment process. Insights from educational program implementation reveal that greater awareness of a disease influences lifestyle choices, which in turn impact overall health outcomes. This new knowledge is efficient both for individuals with insufficient health culture, as well as for health-educated persons. Educational interventions strongly influence patients' health behaviors and personal responsibility (Peterson et al., 2014).

The following effective patient education interventions are summarized. Most of the methods described are in the form of behaviorally focused trainings, structured training, monitoring to support patients' health behavior (control of therapy, blood pressure, etc.). Nursing interventions are integrated to patient needs. They take the form of telephone interviews, multimedia presentations for group learning, focus groups for case discussion and decisionmaking, individual meetings. Most training programs areconducted in a clinical setting followed by home visits. The training is based on the main theoretical approaches in nursing (Vaughan et al., 2017).

In Bulgaria, routine performance of preventive interventions by nurses is difficult to implement. Thereasons are complex: monopoly of the Health Fund,which determines the standards of care quality; organization of work and pay of health care specialists; shortage of nurses and other specialists, low level of autonomy, lack of multidisciplinary teams, etc (Dimitrova et al., 2013).

Ivanova et al. examined the role of the qualified nurse in patient education, mitigating risk factors, and improving quality of life (2016). A significant part of the surveyed patients (48%) reported that they do not have the necessary information and skills to deal with possible complications. A need for knowledge about hygiene regime, physical activity, diet, etc. has been established (Ivanova et al., 2016). Training requirements of individuals with chronic diseases were analyzed for preventing complications and progression of the disease. Potential opportunities for nurses to educate patients in healthy living and self-care were discussed. 43.5% of the interviewees were not trained to deal with the challenges of everyday life in conditions of a chronic disease (Dobrilova et al., 2013). Cardiologists usually offer advice on diet, exercise, etc. as a part of the treatment and prevention, without providing long-term support to patients and their families. There is no effort to build partnerships between patients and medical professionals in this area. Patients expect doctors to take responsibility for their health. There is growing discussion about a healthcare system where patients and their families are better informed, empowered, and actively involved in managing their own health (Kireva et al., 2014; Bender et al., 2014).

CONCLUSION

High-risk heart diseases pose significant threats to individuals' health and lives, with recent trends showing an increasing impact on younger populations. To safeguard public health and enhance the quality of life for patients, research focused on the treatment of cardiac diseases is both crucial and urgent. While general diagnosis and therapy are critical in the treatment of cardiac diseases, patient care plays an equally vital role during this process.Proper care can significantly enhance patients' conditions and greatly alleviate their pain.To prepare cardiology nurses as leaders in cardiovascular prevention, we must identify the specific educational and clinical competencies they need. In Bulgaria, for now, there is no regulated training for the acquisition of a cardiology nursing specialty or a CVD prevention master's program. Nurses can play a leading role in forming health culture and providing multidisciplinary preventive care. For prevention approaches to be maximally effective, they must become part of society's culture. Additional research is necessary to uncover the factors that drive individuals' motivations to engage in responsible personal health behavior.

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