

# Greater Nursing Role for Enhanced Post-Percutaneous Coronary Intervention Management

Tian Zhang<sup>1</sup>  
Xiangxiu Qi<sup>2</sup>

<sup>1</sup>The First Internal Medicine Comprehensive Ward of Shengjing Hospital, China Medical University, Shenyang, People's Republic of China;

<sup>2</sup>Nursing Department of Shengjing Hospital, China Medical University, Shenyang, People's Republic of China

**Abstract:** Percutaneous coronary intervention (PCI) has increasingly been used in management of coronary artery diseases (CAD). Coupled that with an increasing incidence rate of CAD has augmented the hospital burden with consequential post-PCI patient management problems and dissatisfaction. Nursing care has a key role to play in upgrading the healthcare services and raising patients' satisfaction through enhanced patient education and engagement. In this regard, nursing-led intervention has shown some success in three main domains: risk reduction; psychological improvement; and quality of life. Urgent efforts are needed to formulize a structured follow-up with enhanced nursing role in post-PCI management to raise quality of healthcare.

**Keywords:** ischemic heart disease, nursing care, healthcare services, quality of life

## Coronary Artery Disease (CAD)

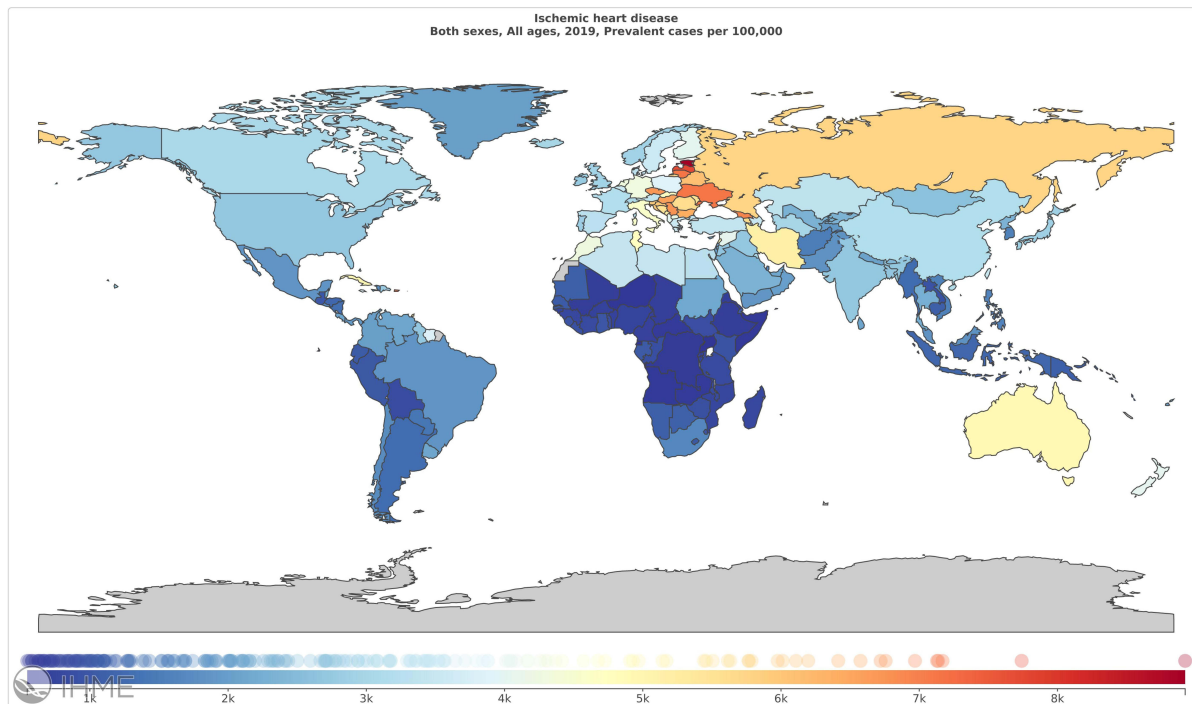
Coronary artery disease (CAD), also known as ischemic heart disease (IHD) and atherosclerotic cardiovascular disease (ACD), is a leading cause of death worldwide.<sup>1</sup> CAD is clinically manifested as myocardial infarction (MI) and ischemic cardiomyopathy with atherosclerosis as the main underlying pathological process.<sup>2,3</sup> Incidence of CAD may continue to rise due to significant increase in prevalence of main associated factors or trends such as smoking, diabetes, obesity, metabolic syndromes, aging, and behavioral changes associated with urbanization and globalization.<sup>4-6</sup> Current epidemiological data on IHD from the Global Burden of Disease (GBD) is illustrated in [Figure 1](#).<sup>7</sup>

## Percutaneous Coronary Intervention (PCI) for CAD

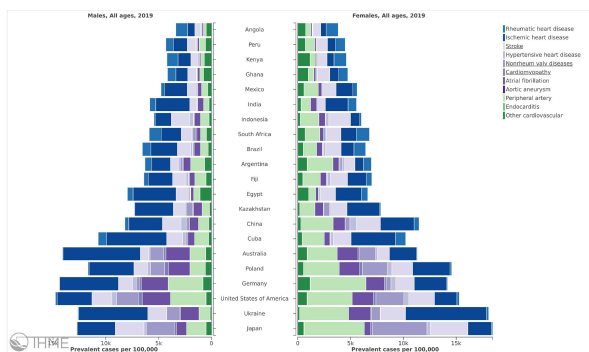
PCI in the form of balloon angioplasty and/or stent implantation has been increasingly used as the initial management strategy with a clear advantage over optimal medical therapy [OMT] in terms of reducing mortality and myocardial infarction (MI).<sup>8-11</sup> As a result, increased admissions/readmissions, hospitalizations, and discharge procedures, as well as, hospital cost in terms of labor and equipment has risen.<sup>12,13</sup> To address this issue, same-day discharge is evaluated and considered viable and safe and is also favored by most patients and family members.<sup>14-16</sup> Nonetheless, certain issues have evolved and remains to be addressed as illustrated in [Figure 2C](#).

Correspondence: Xiangxiu Qi  
Nursing Department of Shengjing Hospital, China Medical University,  
No. 36 Sanhao Street, Heping District,  
Shenyang, Liaoning Province, 110004,  
People's Republic of China  
Email 492215122@qq.com

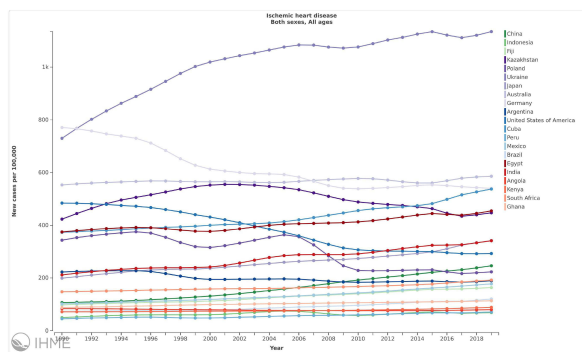
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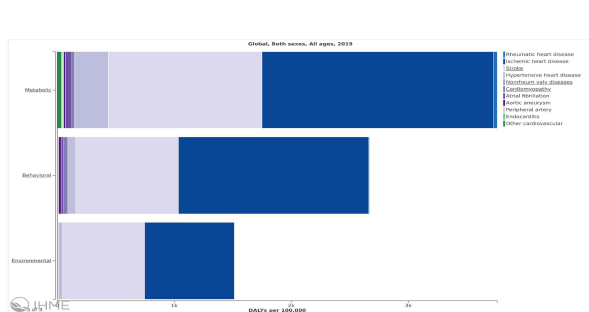
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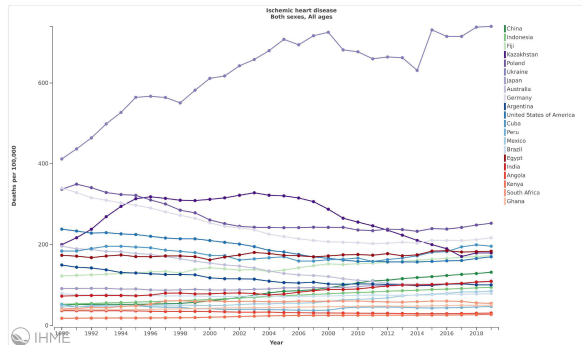
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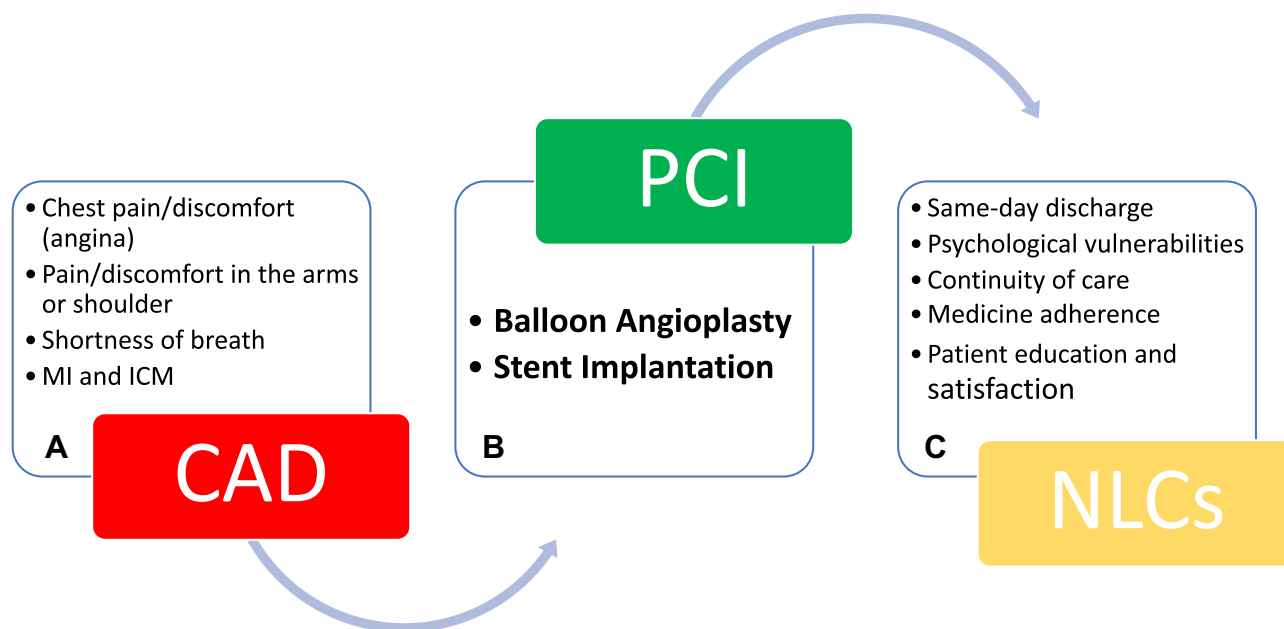
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**Figure 1** Current epidemiological data on ischemic heart disease (IHD) from the Global Burden of Disease (GBD). **(A)** Global prevalence of ischemic heart disease (colors indicate prevalence rates per 100,000 population in 2019). **(B)** Prevalence of IHD among cardiovascular diseases in males and females in various countries. **(C)** Association of risk factors, including metabolic, behavioral, and environmental, and IHD. **(D)** Incidence trend from 1990 to 2018 according to countries. **(E)** Global mortality trends. **Notes:** Current epidemiological data on IHD was obtained from Institute for Health Metrics and Evaluation (IHME). The Global Burden of Disease (GBD) dataset. Available from: <http://vizhub.healthdata.org/gbd-compare>. Used with permission. All rights reserved.<sup>7</sup>



**Figure 2** Nursing role in post-PCI management. **(A)** Coronary artery disease is manifested by pain or discomfort in chest (angina) and/or in the arms and shoulders with shortness of breath. **(B)** Percutaneous coronary intervention (PCI) is undertaken in the form of balloon angioplasty or stent implantation to relieve symptoms. **(C)** Post-PCI management has revealed several problems that requires enhanced nursing role.

**Abbreviations:** CAD, coronary artery disease; MI, myocardial infarction; ICM, ischemic cardiomyopathy; PCI, percutaneous coronary intervention; NLCs, nursing led clinics.

## Post-PCI Conundrums

Patients undergoing PCI have encountered an upsurge in psychological burden and deteriorated quality of life due to lack of information and education about post-discharge health management plan, referral for secondary preventions, self-care compliance, and understanding of their chronic condition.<sup>15,17–21</sup> Vulnerability and anxiety were revealed for lack of post-discharge instruction and uncertainty in assessment of same-day discharge following PCI.<sup>15</sup> In certain cases, uncertainty about their future health and fear for disease recurrence has led to motivation for adopting a healthy lifestyle. While perception of being cured without realization of chronic health condition has resulted in decreased engagement in risk reduction behaviors.<sup>18</sup> Continuity of care following PCI has also been a challenge. An unplanned journey across care boundaries was observed as a result of patients' failure to integrate health information due to lack of adequate instruction and information. Furthermore, facilitation was also required for connections to community-based resources and to schedule clear follow-up appointments.<sup>19</sup> Following first-time PCI, some patients have been found critical of physicians and nurses for uninformative and inadequate medication information for failure to adhere to a medication regimen. While others

have reasoned side effects, generic drugs skepticism, lack of information about disease seriousness, and psychological impact of living with CAD.<sup>20</sup> Readmissions in the early post-discharge period are common and repeatedly linked to limited access to self-care education and preparation.<sup>21</sup> To summarize, enhanced education and information related to post-PCI healthcare management, symptoms attribution, medicine adherence, and readmission assistance should be of prime importance in order to improve community health services.

## Greater Nursing Role and Nursing-Led Clinics (NLCs)

Rapidly expanding medical needs of individuals, communities and healthcare services asks for a broader role and scope of nursing practice. Nursing care has evolved over the years from primary healthcare nursing to nursing-led clinics in modern days. Here, we will review clinical evidence of efficacy of the nursing care in aforementioned scenarios. Management of post-MI/PCI patients can benefit a lot from lifestyle changes and risk reduction behaviors. Nurses can play a key role in education and care that can support and promote patient's engagement in these risk reduction activities.<sup>18</sup> Nursing intervention leading to significant

improvement in lifestyle changes were observed in an RCT, initiated by Lindsay et al, involving 95 (intervention=45; control=50) first-time percutaneous transluminal coronary angioplasty (PTCA) patients. These improvements included significant increase in exercise participation and greater adherence to a healthy heart diet in the intervention cohort at 6 weeks ( $p=0.04$ ;  $p=0.044$ ) and 6 months ( $p=0.05$ ;  $p=0.035$ ), respectively. Moreover, four of the five smoker patients had either quit or actively pursuing to stop smoking at 6 months.<sup>22</sup> Similarly, in a quasi-experimental trial of 30 newly diagnosed ACS patients with PCI intervention, significant difference was detected in self-care compliance including smoking cessation.<sup>23</sup> Smoking cessation was also an apparent feature of Coronas-Watkins et al pilot RCT with 17 patients positive for smoking history had reported of smoking cessation at all time points (days 5–7, 1 month, 3 months).<sup>24</sup> Moreover, a moderate reduction in cardiac self-efficacy (CSE) in the intervention group ( $p=0.60$ ) at days 5–7 and 1 month was also achieved.<sup>24</sup> Hence, medical literature review suggest that a greater nursing role is feasible and certainly helpful in educating and encouraging patients about self-management and undertaking as well as adhering to risk reduction lifestyle changes.

Another aspect that certainly requires greater nursing intervention is the psychological and mental well-being. In fact, nurse-led psychological intervention has shown to reduce anxiety and improved quality of life in post-PCI patients. In a randomized controlled trial of 80 patients (intervention=40; control=40), significantly higher anxiety level, which was assessed with Zung Self-Rating Anxiety Scale (SAS), in the control group was observed at 12 months follow-up than the baseline and compared to intervention group.<sup>25</sup> Mean trait anxiety score assessed with State-Trait Anxiety Inventory (STAI), which is a psychological inventory based on a 4-point Likert scale and consists of 40 questions on a self-report basis, had shown greater decrease in the intervention group than in the control group at days 5–7 and 1 month in the randomized pilot study of nurse-led clinic initiated by Coronas-Watkins et al.<sup>24</sup> Intervention group also had achieved greater total change ( $d=0.50$ ) from baseline than in the control group ( $d=0.16$ ).<sup>24</sup> Depressive symptoms assessed with Cardiac Depression Scale (CDS) were also reduced in the intervention ( $d=0.26$ ) as well as control group ( $d=0.37$ ). These studies indicate that nurse-led initiative can successfully lower the anxiety level in post-PCI

patients thereby lowering the psychological burden which may also yield long-term benefits for these patients.

Nursing intervention have also shown to improve quality of life assessed with various clinical indices. In a randomized controlled trial ( $n=80$ ), significant progress was seen in intervention group assessed with three domains of Seattle Angina Questionnaire (SAQ) 12 months after undergoing PCI.<sup>25</sup> In the Lindsay et al. RCT, quality of life assessed with Quality-of-Life Index-Cardiac Version III (QLI-CVIII) showed significant difference between the groups for QLI-CVIII scores at 6 weeks ( $p=0.05$ ) and 6 months ( $p=0.04$ ), but not at 1 year.<sup>22</sup> Shim and Hwang also reported improvement in mental health assessed with scale based on American Heart Association Cardiovascular Risk Factor Assessment Tool Health-related quality of life (HRQoL). Overall, nursing-led intervention has demonstrated improvement in three main dimensions of post-PCI scenario in short term assessments including self-management and risk reduction engagement, anxiety reduction and quality of life (Figure 3). However, long-term efficacy outcomes such as mortality, emergency presentations, and readmissions has not been fully assessed with one study reporting failure of nursing-led clinics in this regard.<sup>26</sup> Nonetheless, further larger studies are warranted to evaluate and validate the efficacy of nurse-led clinics or enhanced nursing role in the post-PCI management with a focus on long term outcomes. The greater nursing role should include all these aspects such as patient education about self-reliance, engagements in risk reduction activities, medicine adherence, scheduled follow-up at secondary cardiac clinics, and professional psychological intervention. These steps can further improve the quality of life, patient's satisfaction, reduce hospital burden with readmissions and may lead into lower mortality.

In conclusion, Nursing-led intervention seems to improve various aspects of post-PCI problems such as self-management, healthy-heart lifestyle modifications, psychological well-being and quality of life. Further research is warranted to develop a structured post-PCI management plan with enhanced responsibilities assigned to nursing staff in order to improve patients' quality of life and satisfaction in the post-discharge period.

## Author Contributions

All authors contributed to data analysis, drafting or revising the article, gave final approval of the version to be



**Figure 3** Nursing-led clinics has shown improvement in three main dimensions such as, risk reduction, self-management, psychological improvement, and quality of life.

published, agreed to the submitted journal, and agree to be accountable for all aspects of the work.

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The authors report no conflicts of interest in this work.

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