Integrating mental health into cardiovascular disease research in India

GITANJALI NARAYANAN, DORAIRAJ PRABHAKARAN

ABSTRACT
Mental health refers to a diverse field where individuals can cope with daily stress, realize their potential and maintain a state of well-being. In recent years, there has been increasing recognition of the influence of mental health on general health, and in particular on cardiovascular diseases and their risk factors. Epidemiological research has focused on several psychosocial components including social determinants, comorbid psychiatric disorders, psychological stress, coping styles, social support, burden on the family, well-being, life satisfaction, personality and cognitive factors in connection with cardiovascular diseases. There is epidemiological research in India that integrates mental health with common cardiovascular diseases such as coronary heart disease and stroke. Data from mental health research is sufficiently compelling to highlight the role of chronic stress, socioeconomic status and psychiatric disorders such as depression, substance use, social networks and support in relation to vulnerability to cardiovascular diseases. There are psychosocial consequences of cardiovascular diseases including deficits in the domains of life skills, coping skills and neurocognition, in addition to caregiver burden. The implications of bio-psychosocial models of assessments and interventions that target complex individual and contextual variables simultaneously on cardiovascular treatment outcomes have highlighted the importance of studying mental health in Indian settings. Integration of mental health into mainstream research is the need of the hour. A multidimensional approach to accomplish this is required including at the level of research conceptualization, discussions with key stakeholders, at the policy level, at the institutional level, and at the clinical and community level.

INTRODUCTION
The importance of studying mental health (MH) in cardiovascular disease (CVD) epidemiology is being increasingly recognized in India in view of escalating comorbid diseases, greater burden on the family and social health costs and pronounced differences observed across different socioeconomic settings. CVD alone has emerged as a major cause of mortality and disability in India over the past few decades. Furthermore, CVD can cause devastating consequences to individuals, families and communities, and the social burden of CVD needs to be understood. Individuals are embedded in a social context and their health behaviours are shaped to a large extent by the interpretation and meanings they ascribe to this environment. Psychosocial factors could play a major role in influencing health outcomes. It thus becomes important to address the underlying psychological and social factors that interact with biological variables in influencing CVD in the Indian context. We review the role of MH in CVD, the need for integrating MH research with CVD and identify core research areas that need prioritization.

SEARCH METHODOLOGY
We did a systematic search for relevant epidemiological Indian studies on psychiatric disorders and CVD on MEDLINE, PsychINFO and Google Scholar, with reports from WHO and other international agencies. We scanned the literature on adults across urban and rural settings of both sexes, incorporating qualitative, statistical and mixed method designs. The inclusion criteria consisted of clearly defined parameters of MH, including psychiatric disorders, psychosocial stress, personality disorders, quality of life, well-being and family variables in connection with CVDs and their risk factors. We defined CVDs for the purpose of the review as heart disease and stroke, and risk factors as diabetes, hypertension, obesity, physical inactivity, and tobacco and alcohol consumption. Studies were excluded if they were conducted primarily on children and adolescents, were published in non-scientific journals, were case studies, historical studies, or where the relationship between MH and CVDs was not clearly delineated.

MH IN CVD RESEARCH: THE RELEVANCE
The WHO defines MH as ‘a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community’. According to WHO, there can be ‘no health without mental health’. The field of MH within CVD is a highly complex and challenging area that includes several components such as stressful life events, presence of comorbid psychiatric disorders especially depression, anxiety...
disorders and substance use, social support networks, social ties and social conflict, and several sociodemographic aspects such as poverty and gender. This has been highlighted by the WHO (Table 1).16

Though not well recognized by most cardiovascular physicians, the impact of psychiatric disorders is widespread in India, with one in four Indian families suffering the burden. At least 7% of the adult population suffers from a serious mental illness such as schizophrenia and mood disorders. This figure increases substantially if we consider alcohol use disorders and common mental conditions such as anxiety. Depression alone accounts for over 3.6% of disability-adjusted life-years (DALYs) and is projected to be one of four major causes of loss of DALYs by 2030. Moreover, it is a major contributor in absenteeism from work and suicide and leads to a marked rise in healthcare expenditures. Even more startling is the high comorbidity between psychiatric diseases and CVD and their risk factors, especially diseases such as depression, anxiety or dementia with diabetes.1,4

To highlight the different relationships that exist between MH, CVD and its risk factors, we discuss Indian studies in the following three sections.

**MH AND PSYCHOSOCIAL VARIABLES**

**As a risk factor for CVD**

A risk factor is defined as a characteristic or exposure of an individual whose presence or absence raises the probability of CVD outcome, morbidity and mortality. The array of studies outlined here demonstrate the relationship between psychosocial variables such as stress, personality and social gradient that determine or are associated with CVD end-points or different CVD risk factors such as smoking, alcohol consumption, obesity, diabetes and physical inactivity.

**Table I. Social determinants of health**

<table>
<thead>
<tr>
<th>Social gradient</th>
<th>As people move down the social ladder, life expectancy becomes lower. There are greater disadvantages such as insecure employment and poor housing that have a cumulative effect on diseases.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>Includes chronic anxiety, insecurity, lack of control over work and home environment, low self-esteem and lack of supportive friendships.</td>
</tr>
<tr>
<td>Early life experiences</td>
<td>Poor circumstances during pregnancy and infancy are related to insufficient growth in cognitive, emotional and sensory development and subsequent health problems.</td>
</tr>
<tr>
<td>Social exclusion</td>
<td>Absolute and relative poverty, deprivation and social exclusion, including discrimination, unemployment, lack of housing, marginalization and stigmatization</td>
</tr>
<tr>
<td>Work</td>
<td>Broadly speaking, work buffers against illnesses, but the job environment is an important determinant of health.</td>
</tr>
<tr>
<td>Unemployment</td>
<td>The psychological consequences of unemployment in terms of threats faced, as well as financial debts, makes this a risk factor.</td>
</tr>
<tr>
<td>Social support</td>
<td>This has an important protective effect on health, and provides individuals with emotional and practical resources that encourage healthy behavioural patterns while instilling well-being.</td>
</tr>
<tr>
<td>Addiction</td>
<td>Alcohol use disorders, illicit drug use and tobacco use create health inequalities and social disadvantages.</td>
</tr>
<tr>
<td>Food</td>
<td>Adequate, affordable food supply and healthy diet promote health and well-being.</td>
</tr>
<tr>
<td>Transport</td>
<td>Use of healthy transport such as cycling, walking and public transport promotes physical activity and health and reduces fatal accidents.</td>
</tr>
</tbody>
</table>

(Source: WHO, 2003, reprinted with permission)26

**As a comorbid condition**

We have examined studies highlighting which psychiatric disorders are commonly found comorbid in CVD and their risk factors in India, while reviewing the role of gender and social settings in these co-occurring conditions.

**As a consequence of CVD**

Chronic diseases can lead to several MH outcomes including a poorer quality of life, less well-being, psychiatric disorders and disruption in social networks. These are presented in this section.

**MH AS A RISK FACTOR FOR CVD**

A large number of MH variables have been investigated in connection with CVD and CVD-related risk factors in India. To highlight some of the essential psychosocial risk factors that play a role in CVD, we focus on four broad risk factors: (i) psychosocial stress which includes major life events and negative emotional states; (ii) personality variables; (iii) family and social support; and (iv) social gradient.

**Psychosocial stress**

According to Rao, stress is defined as an interactive process between an individual and her/his environment, and it is the perception of the event rather than the event itself that has an implication on subsequent coping and health. In this context, major life events such as death of a significant other, marriage, career change and divorce are well-established social markers of different disease outcomes in western countries, and some studies have attempted to replicate them in India. Conclusions across these studies have been similar—a sedentary lifestyle, absence of coping mechanisms, work stress, low level of control over one’s job and negative emotions have been associated with coronary heart disease (CHD), with significant urban–rural differences. Studies also reveal that CHD is influenced by coping styles, social exclusion, education status and job strain. A recent small study on the relationship between stressful life events and coronary artery disease (CAD; n=90) conducted in northern India revealed that both mean lifetime stressful events and mean past one year’s stressful events were statistically significant as compared to controls. This was replicated by another case–control study (n=100) on acute myocardial infarction (AMI) that used the Presumptive Stressful Life Events Scale to show that those with AMI reported significantly higher lifetime stress and stress over the past year as compared to controls. A hospital-based, qualitatively driven study on 100 patients with diabetes in northern India revealed that over 60% of patients had a pessimistic attitude about their illness at the time of diagnosis. It also found that less awareness about diabetes and a negative mood was related to poor adherence to exercise routines and lifestyle management practices.

Similarly, some researchers have examined the impact of stress in CVD across specific settings. One such study found that >60% of their medical student participants reported stress due to academic demands that had a significant association with cardiovascular regulation. A recent study on tribal populations of Sikkim indicated that perceived stress has a significant relationship with CVD risk factors including diastolic blood pressure, total cholesterol (TC) and ratio of TC and high-density lipoprotein (HDL) cholesterol in men. In women, the study revealed a significant association with obesity measures, highlighting the role of the rapid sociocultural changes in this region on health. These studies using retrospective memories of stress in coronary patients indicate the need for larger prospective
studies that will allow us to draw causal connections between stress and CVD.

**Personality**

It has been postulated that the personality of individuals has a bearing on perceptions of heart disease, and whether or not they would develop CVD. Traditionally, the coronary-prone type A personality, defined as ‘a behaviour pattern where the person is aggressively involved in a chronic, incessant struggle to achieve more and more in less and less time, and if required to do so, against the opposing efforts of other things or other persons’ has received some attention. To test this empirically, a study was conducted on 90 adults with CAD who were tested using Jenkins Activity Inventory. The authors reported that 57% of their CAD participants had a type A personality, which included a combination of being impatient, competitive and excessively involved in one’s work. Similar findings were found in a more current study on AMI, wherein AMI cases reported significantly higher scores on type A personality traits such as dominance, activity, superego, paranoia and introversion than controls. Other cognitive orientations, viz. optimism and positive explanatory style, have demonstrated consistent relations with how people interpret life events, and are robust indices of MH. The authors suggest that optimistic people explain negative life events such as a heart disease as being caused by external and specific factors, while people with a pessimistic explanatory style attribute the disease to global and stable factors that cannot be changed and that are internal. To highlight the cultural context within which personality traits of CVD participants emerge, a study on 50 CVD cases and controls found that such individuals show a greater anxious preoccupation over their physical problems and consequent withdrawal from interpersonal relations, with a restricted range of interests. The authors used different personality questionnaires and locally constructed methods to assess karma or the Indian belief in action without concern for reward, with the hypothesis that this might clash with modern material beliefs and lead to a higher incidence of CHD. Such studies suggest the need to incorporate indigenous MH constructs with mainstream health research to derive the rich complexity of local illness behaviours of persons.

**Family and social support**

India is traditionally known for its strong collectivist orientation with an emphasis on social ties, social support and kinship. As the average age of an Indian increases, social customs in urban settings change, and different family structures emerge, it becomes pivotal to understand the CVD burden experienced by the family and its role in determining CVD risk. This can be evidenced by estimates that indicate that between 85% and 95% of all healthcare costs in India are borne by household income. However, studies incorporating family surveys on stress and family burden of CVD are still in their nascent phase in India. These suggest that the erosion of the traditional joint family structure and the development of nuclear family patterns with dual income partners and more sedentary lifestyles have been associated with increased CVD risk. A recent population-based study on 500 older adults from Chennai highlighted this by drawing attention to how social support gets mobilized following a health-related crisis, but with time, this support gradually declines. Furthermore, the author suggests that abuse and neglect faced by ill family members may not be disclosed due to taboo and stigma. At a national level, it is well-documented that the primary source of support in India is the family, which becomes more pronounced for the elderly who are often dependent on adult children for their emotional, physical and financial needs. On the other hand, although Indians have access to multiple social networks, this may not translate to availability of social support, especially while coping with a CVD. These findings underscore the importance of qualitatively driven, culture-sensitive epidemiological research that taps on the changing nature of the social environment and its impact on CVD.

Social support has often been considered a protective factor in health. This hypothesis was tested in 357 community residents in Kerala. Results indicated that for women, being married was associated with 54% lower odds of being hypertensive. The authors suggest that in Kerala, where women are frequently economically dependent on their spouses, being away from their spouses or being single is associated with hypertension. There is, however, considerable scope for studying the buffering nature of social support across other CVD risk factors.

**Social gradient**

The evidence for social patterning of CVD has been well-established. India has pronounced urban–rural differences, with approximately 70% of its population residing in over 550,000 villages and the rest in over 200 towns and cities. Under such circumstances, the social gradient has a marked impact on health indices and reflects disadvantages due to lack of social integration, poor housing, differences in social status, fewer employment opportunities and health benefits. The effects of this are often cumulative on disease outcomes. Examining the impact of education and housing, Gupta et al. reported a higher prevalence of CHD among uneducated and less educated Indians in rural Rajasthan and among those with poorer housing across both sexes (n=3148). The study highlighted that having more children (≥4 children, OR 2.10; 95% CI 1.51–2.93) and crowded housing (OR 1.48; 95% CI 1.04–2.10) were associated risk factors. The risk of AMI appeared to be two times higher among the lesser educated and those with a lower socioeconomic status. Socioeconomic status was also associated with angina mortality in a study, with higher reported mortality rates among poorer as compared to richer patients. They also differed significantly in terms of the treatment received. Richer patients received access to improved coronary interventions, adjustments for which eliminated the mortality difference among the two groups.

Other studies have similarly implicated education as a risk factor for CVD. A hospital-based case–control study conducted across eight hospitals in Delhi and Bangalore (n=350 cases, 700 controls) revealed that the relative risk for ischaemic heart disease is significantly higher among the urban educated adult population than those with no education. A large surveillance of ten industrial populations (n=19,973) has highlighted that tobacco use and hypertension is significantly more prevalent among the less educated, while dyslipidaemia is higher among the more educated. The study also showed that significantly fewer men in the lower educated group in comparison to the higher educated group with hypertension sought treatment despite high prevalence of the condition. In particular, research on tobacco smoking has revealed that the prevalence is significantly higher among poorer people from rural backgrounds. Further, gender differences are marked. Across most epidemiological studies, men smoke significantly more than women and education has a direct influence, with illiteracy being associated with more smoking. This is true even for rural women. Research indicates that women consumed
Comorbidity Between Psychiatric Disorders and CVD

The proportion of individuals with mental and neuropsychiatric illnesses has increased dramatically in India, so that a large number of individuals now present themselves at different primary care settings and community healthcare services with comorbid CVD. Among the different diseases examined, the relationship between depression and diabetes has received maximum attention, with daunting comorbid prevalence rates of 22%–29%.5 At least two different theoretical approaches have attempted to understand the relationship between these two disease states in India—either as a psychological reaction to the impairment caused by the disease or due to a direct causal connection.1 Other factors examined in CVD studies that have been implicated as having an association with depression include older age, being a woman, low literacy level and poor social infrastructure. Researchers suggest that concurrent physical illnesses increase psychiatric vulnerability, while diagnosis of a mental illness leads to poorer treatment outcomes and adherence.55

One of the largest population-based studies on depression estimated an overall prevalence of 14.3% of depressive symptoms in urban south Indians (n=24 503), which escalated to 23.4% where individuals had a comorbid type 2 diabetes mellitus. The risk of depression was highest among people who were newly diagnosed with diabetes, with a prevalence rate of 19.6%, indicating the need to intervene at the time of diagnosis.56 The authors further suggest that diabetes-related complications such as neuropathy, nephropathy, peripheral vascular disease and diabetic retinopathy were associated with significantly greater depressive symptoms and distress, after controlling for confounders. Recent evidence from case–control studies also indicates that negative mood states and less knowledge about diabetes at the time of diagnosis are associated with poor adherence to self-management regimens.57 Data from a cohort of 241 patients with diabetes in southern India have revealed significant gender differences, with women reporting higher levels of depression and anxiety than men.58 Other studies have reported similar findings, with women with diabetes reporting a poorer quality of life and greater psychological distress than men.59

The comorbidity between anxiety and depressive disorders with CAD was studied in an emergency care setting (n=337). The findings of this study indicated that 23% of patients had a concomitant psychiatric syndrome.60 The authors suggest that the commonality of symptoms between anxiety disorders and MI, especially in developing countries wherein somatization of psychological distress is frequent, makes dual diagnosis a challenging task. They also point to the need to screen for and identify mental disorders when patients visit a healthcare facility so as to offer adequate intervention.

Apart from common mental disorders, studies also report the co-occurrence of Alzheimer disease and diabetes, especially as people age. To study the underlying mechanisms of this clustering effect, researchers have examined the role of common proteins, having implicated butyrylcholinesterase- and acetylcholinesterase-related proteins.61 According to the authors, these proteins may play an aetiological role by influencing insulin resistance and lipid metabolism, and suggest that the esterase group of enzymes may be the common thread linking the coexistence between Alzheimer and diabetes. Studies have also linked eating disorders such as anorexia and bulimia with diabetes and other chronic diseases which are associated with strict dietary restrictions and control.62 These studies underscore the relevance of studying comorbid diseases that will help researchers address health more globally.

Psychological Consequences of CVD

CVD has debilitating social consequences on the individual, the family and the community. To understand the implications of CVD and its risk factors on mental health indices, we discuss (i) stress, coping, adjustment, and caregiver burden after CVD, and (ii) cognitive and life-skills deficits and psychiatric disorders after CVD.

Stress, coping, adjustment and caregiver burden after CVD

Research that has focused on stress as a consequence of CVD and methods used to cope with it has suggested that a more active coping strategy such as trying to find solutions and greater control over diabetes leads to positive appraisal, while less control, using emotional forms of coping such as avoidance or denial are related to negative appraisal of the illness.63 A case–control study from Chennai suggests that over half the enrolled cases of MI reported high levels of subjective mental stress, which was equally distributed across the sexes, in contrast to <20% among controls.64 The specific stressors included unexpected financial difficulties and death or severe illness in the family. This study highlighted the cultural context of stress experienced in India subsequent to a cardiac event, and suggested the need to replicate related findings in population-based studies.

The relationship between coping, social support and diabetes was highlighted in a longitudinal study in southern Indian.65 Results indicated that regardless of gender, individuals with diabetes who frequented clinics more number of times sought more social support, especially from their spouses for sharing their doubts and anxieties concerning the disease. A majority reported that their spouse considered diabetes to be a minor problem that could be managed with minimal support. While women experienced greater stress, poorer quality of life and guilt over diabetes than men, the study revealed that all participants who came for at least four medical visits showed a significant
decrease in anxiety and stress. This study highlights the usefulness of incorporating stress and social support appraisal into routine clinical practice. A study examining which type of coping was used among 90 participants of diabetes and heart disease found that active coping led to a realistic acknowledgement of potential solutions, planning for the future and confronting it, and was associated with the best health outcome. Researchers suggest that clinicians must be aware and anticipate these associated states, and be trained in their management. These constructs have been utilized in recovery from CVD, regaining a sense of personal control as well as mastery over MI and other heart conditions.

Studies exploring the role of adjusting with diabetes have shown that individuals who integrate themselves, i.e. emotionally adjust to diabetes, have enhanced psychological well-being. Findings suggest that high adjustment is negatively associated with depression and anxiety and positively associated with an overall sense of well-being. Similarly, health is considered a key component of life satisfaction and well-being. Researchers have further hypothesized that knowing that one has acquired a debilitating condition such as diabetes or a similar chronic disorder is associated with several negative psychological states such as denial, anger, guilt and reactive depression that need to be addressed before it can lead to acceptance.

The stress experienced and coping strategies used in the case of CVD affects not just the individual but the entire family. In this connection, examining the caregiving burden and MH of the family following a chronic disease such as stroke becomes important. Researchers hypothesize that caregivers in India are predominantly women caring for a spouse, a parent or an in-law, and often feelings of burden are not verbalized, but performed as a duty, along with multiple other tasks, such as a job, parenting and housekeeping, creating excessive role strain. With additional health expenses, the increasing family burden may lead to conflicts and interpersonal stress, unless relieved through home-based, low-cost intervention programmes. One such study on 46 stroke survivors revealed a significant association between caregiver burden and poorer quality of life in patients after stroke, highlighting the need for family-centric, caregiver education and training. A similar study on 146 stroke survivors revealed that quality of life is influenced by anxiety, depression and functional dependence of participants, and that even mild stroke affects quality of life. This is especially true within a relational society such as India, where increased demands are placed on family members for caregiving even as treatment options and access to healthcare may be limited.

Cognitive and life-skills deficits and psychiatric disorders after CVD

A large population-based survey among the elderly in Kolkata revealed that CVD and its risk factors such as hypertension, diabetes, and smoking and chewing tobacco are related with mild cognitive impairment, which is defined as a transitional disorder between age-associated memory impairment and dementia. The study found a prevalence of 14.9% for mild cognitive impairment, which may be modifiable through intervention and education. Studies have also shown that diabetes affects cognitive functions such as memory, mental speed and eye-hand coordination. Even among young and middle-aged adults, significant cognitive impairments have been reported. Reports have indicated that almost a quarter of people with diabetes have cognitive deficits that impact performing activities of daily living, while more than half have distal symmetrical polyneuropathy. Further, deficits in attention, repetition and memory have been found. Researchers suggest that chronic diabetes leads to difficulties in learning and acquiring cognitive skills.

Chronic diseases such as stroke have also been found to affect the brain by causing behavioural changes, mood disruptions and psychosis. It is well-known that depression and disability follow stroke, and that the social consequences of stroke considerably lengthen rehabilitation and recovery time. With prevalence rates as high as 61%, post-stroke depression among the elderly is high and associated with poor quality of life and disability across different life domains. While researchers have reviewed these psychological consequences of physical illnesses, it would be important to examine these empirically in the Indian setting.

WHY MH SHOULD BE INTEGRATED WITH CVD

Over 7% of the Indian population suffers from a psychiatric disorder. A large number of these present to primary care settings. Other at-risk populations, including the rural, the aged, certain tribal communities, the severely psychotic and substance dependent individuals and those who are low in the social hierarchy have poor access to healthcare. Addressing their needs, while being sensitive to their physical health, becomes pivotal. However, at present, comorbid prevalence rates between psychiatric disorders and CVD across urban and rural settings and both sexes have not been clearly established in India. Doing so will serve two purposes. First, it will highlight which neuropsychiatric disorders, e.g. depression, alcohol use disorders, anxiety disorders, etc. are more prevalent in India and in which community. Second, this will help establish appropriate integrated bio-psychosocial intervention models that target complex individual and community level variables simultaneously, thereby improving treatment outcomes and medical adherence. There is a need to test the efficacy of psychosocially driven therapies such as cognitive therapies, mindfulness-based stress reduction, behaviour modification strategies and lifestyle interventions including yoga and relaxation training in CVD. Identification of relevant MH variables that have been tested in intervention trials will help guide clinicians to formulate their treatment programmes.

While studies in western countries have established the role of social risk factors such as negative mood states, stressful life events, support, quality of life, personality and social isolation, the same need to be contextualized into mainstream Indian epidemiological health research. The majority of the world’s population of 450 million people who suffer from a mental problem live in developing countries, of whom <10% receive any kind of attention. It will be important to address the reasons why MH has been marginalized from mainstream research and provide such individuals with better healthcare access. Individuals have differing health requirements that depend on variables such as the social environment they are exposed to and their unique interpretation of it, their coping strategies, their family and community setting, as well as multiple personal-level variables that differ across the sexes. Incorporating these psychosocial and behavioural needs into mainstream research would help improve health outcomes, initiate superior intervention programmes and enhance community awareness of MH issues.

Methods of integrating MH in CVD epidemiological research in India

There are several steps that can be initiated at different levels to integrate MH into mainstream health research. These can be at the level of planning and implementing a research project, at an
institutional/policy level, at the educational level, at the clinical level and at the caregiver/community level. Epidemiological studies that utilize mixed methods including qualitative and statistical designs to obtain an exhaustive and in-depth understanding of the sociocultural context are required. Within a heterogeneous culture such as India, it would be essential to have qualitatively driven approaches that tap the mindsets of different populations, and incorporate them into standard surveys. Data pooling of large-scale, population-based studies would help researchers to arrive at comorbid prevalence rates between psychiatric and chronic diseases which, in turn, would help them to develop appropriate integrated intervention programmes. In this context, incorporating brief stress management programmes and lifestyle interventions in epidemiological research and assessing their effectiveness would warrant further study.

An important goal would be routine screening of depression and other common psychiatric disorders such as anxiety and somatization that are known to impair health status through the use of brief assessment tools in population-based studies. This will help to establish comorbid prevalence rates at different phases of a chronic disease and sensitize clinicians to mental health conditions that were previously overlooked. Further, development of integrated educational curricula that teach researchers about the social determinants of health as part of standard epidemiological training may be warranted to train more social scientists and epidemiologists. Sensitizing all healthcare insurance companies, non-governmental organizations and service providers in India to the MH needs of the population will help them to incorporate these into their research agenda.

CHALLENGES AND FUTURE DIRECTIONS

Data from MH research has been sufficiently compelling to highlight the role of chronic stress, socioeconomic status, psychiatric disorders such as depression and anxiety, substance use, social networks and support in relation to vulnerability to CVD. Thus, we need to address MH in individuals with CVD and its risk factors.

The challenges faced in integration of CVD and MH is at multiple levels. The biggest challenge is to convince policymakers that MH is an important goal in health research, and that cost-effect intervention strategies can be developed that will address these concerns. At present, <1% of the health budget is spent on MH.77 There is a scarcity of human resources, with just 0.4 psychiatrists and 0.02 psychologists per 100,000 population.78 This is further compounded by the brain drain with trained clinicians and MH researchers leaving the country in search of better career prospects.79,80 However, a welcome development has been the importance given to both the disorders by the government by developing the national programme for prevention and control of CVD, diabetes, cancer and stroke, and the vigorous advocacy by the government and international agencies at the 2010 United Nations General Assembly meeting to include MH as a key focus area of prevention along with non-communicable diseases.

In conclusion, we have highlighted the role of MH in CVD and their risk factors in the Indian setting, and outlined various studies conducted with psychosocial variables as risk factors, as comorbidity conditions, and as a consequence of CVD. Our attempt is to underscore the relevance of integrating MH into mainstream CVD epidemiological research and provide methods of overcoming the challenges faced.

REFERENCES