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Psychosocial Stressors among Patients of Ischaemic Heart Disease, Diabetes Mellitus, Stroke and Depression: A Comparative Study

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Abstract

Stressful life experiences have been a significant contributing factor to the development of psychological discomfort. These events have been linked to the subsequent development of Ischaemic heart disease (IHD), Diabetes mellitus (DM), Stroke, and Depression. Our study aimed to investigate the various types, numbers, average stress scores, and gender disparities in stressful life events occurring within one year prior to the development of these four diseases. This cross-sectional descriptive study was carried out at Bangabandhu Sheikh Mujib Medical University's (BSMMU), Department of Psychiatry, Dhaka, from July 2017 to June 2018. A total of 200 samples (50 patients from each department) were taken. After receiving informed consent, patients of both sexes, aged 18 and above, were asked to complete the socio-demographic questionnaire and the Dhaka Stress Scale-Adult version (DSS-A). Stressful life events of DSS-A were marked as experienced in the last year before the onset of the disease. The mean of the total number of life events experienced by these patients was 4.22(SD=1.8), 3.58(SD=1.8), 3.3(SD=1.8), and 4.5(SD=1.5) in IHD, DM, Stroke, and Depression, respectively. Of the four groups, male patients with depression and females with IHD experienced the highest number of life events, with a mean of 4 and 5, respectively. In our population, the average individual experiences an average of three to five stressful life events in the last year before having these four diseases. Mean stress score (MSC) was highest in males (MSC=286) and females (MSC=363) with depression. Among the four groups, 34 (17%) patients perceived a mild level of stress, followed by 67 (33.5%) patients at a moderate level and 99 (49.5%) patients at a severe level of stress. There were 227 (29%) stressful life events reported by depressed patients, followed by 212 (27%), 180 (23%), and 165 (21%) stressful life events by IHD, DM, and stroke patients, respectively. Stressful life events were more common in women than in men with depression, with a male: female ratio of 1:2.6. Overall male-female ratio of four diseases was 1:1.2. Total stress scores ranging from 33 to 680 with highest MSC of 339 (SD=125.7) reported by patients with depression followed by 307 (SD=142) MSC perceived by patients with Ischaemic Heart Disease and 274 (SD=152) by diabetic patients. However, It was lowest (MSC=252, SD=143.5) in patients with stroke. In conclusion, stressful life events play an important factor in the later development of Ischaemic heart disease, Diabetes mellitus, Stroke, and Depression.

Keywords: Stress; Stressful life events; Ischaemic heart disease; Diabetes mellitus; Stroke; Depression

Introduction

An examination of health status would be incomplete without evaluating psychosocial stress. Stress is one of the most common causes of psychiatric and medical conditions. It may result in enormous psychosocial difficulties. In ancient times, Hippocrates (460–377 BC) said, "It is better to know the patient who has the disease than it is to know the disease which the patient has" [1]. Understanding the psychosocial influences is an essential part of "knowing the patient".

The Concept of Stress

Stress is defined as the disruption of our normal psychological and physiological functioning when a challenge threatens our ability to cope adequately, and things that produce stress are called stressors, which depend on individual adjusting capacity [2]. In the modern age, Walter Cannon was the first to write about stress and use the term extensively. Mr Cannon stated, "Stress is the nonspecific response of the body to any demand made upon it." [2]. There are three important components of stress: a stressful event, appraisal, and stress reaction. A stressful event is any situation that the individual perceives as threatening. Perception of an individual of an event is an appraisal, which challenges personal goals and coping ability. Stress reactions are the disruptive effects of stressful events on psychological and physiological functioning [3]. Any event can be stressful if an

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individual perceives it as stress. So, it is not possible to quantify an event as stressful in advance. Stressful events may be an acute and chronic source of Stress. Acute sources of stress or daily hassles are day-in and day-out frustrations, such as the illness of a family member or home maintenance. Chronic sources of stress, which have cumulative effects, are ongoing life difficulties that include low income and poor housing. There are three essential characteristics of stressful events: Hopelessness, overload, and conflict. Helplessness event occurs when an unwanted situation happens regardless of anything we do or not to do. Overload occurs when an event is so severe that we cannot cope with it. Conflict arises when environmental stimuli arouse two or more incompatible motives. On the other hand, appraisals may be primary and secondary. Primary appraisal is an individual's perception of an event as a threat to well-being. Secondary appraisal is an individual's judgment of the availability of personal coping sources. The third component of stress is stress reaction, which may involve emotional, cognitive, and physiological disruption [3].

Hans Selye's view on Stress

In 1936, Canadian biologist Hans Selye became the first researcher to examine how psychological stress affects the human body [4]. He distinguished between stress, stressor, and stress reaction, which he considered a complex phenomenon. The system goes into a defines state when it senses a threat and tries to regain equilibrium in various ways. The body goes into a "fight or flight" response as part of this adaptive system. However, "General Adaptation Syndrome" may result if the arousal state persists over time. The author distinguishes three stages in reaction to a stressor. The first is an "alarm reaction": the homeostatic balance is changed, which increases energy availability and makes the situation easier to handle. Homeostasis is restored if the danger disappears. When the stimulus persists, we enter the second stage, called "resistance or adaptation". Chemical parameters and visceral functions are kept in a modified state as long as the threat is present. This suggests a higher central and peripheral functioning level as well as a significant energy expenditure. However, a person's resilience varies depending on genetic, cognitive, and psychological characteristics, and they cannot always handle a hostile environment. Over time, it leads to an "exhaustion" of adaptability (third phase), and the individual may become unwell or perhaps pass away. This occurs particularly when the threat is unavoidable, undesired, and recurring; if the stress is brief, the body returns to normal with no adverse effects.

Selyes' theory has been supported by research in recent years, which increasingly demonstrates how prolonged stress may encourage the formation of somatic diseases in vulnerable individuals. In actuality, prolonged exposure to negative events impacts immunological function, metabolism, and hormonal balance [5]. In particular, chronic activation of the hypothalamus-pituitary-adrenal (HPA) axis raises glucocorticoid levels, leading to hypercortisolism-related disorders. Moreover, central obesity, peripheral tissue insulin resistance, and glucose intolerance are all made easier by this illness, which also encourages immune function changes. However, not everyone experiences these processes in the same way, and certain gender-related differences have been discovered by researchers [6]. In fact, according to some writers, the greater susceptibility of women to autoimmune disorders and the greater vulnerability of men to infectious and vascular diseases may be explained, at least in part, by gender variations in the stress system [7]. Indeed, new evidence from molecular research indicates that estrogenic hormone is a key player in the onset of autoimmune illness [8].

Stress and IHD

The American Heart Association (AHA) estimates that 15.5 million Americans between the ages of 20 and over have coronary heart disease (CHD), and approximately every 42 seconds, an American will suffer from a myocardial infarction (MI) [9]. According to a 2014 study that used data from the World Health Organization (WHO) from 49 nations in Europe and northern Asia, CVD causes more than 4 million deaths annually [10]. Psychosocial factors such as low social support or low socioeconomic status have been found to be associated with the etiology and prognosis of CHD [11]. Educational level was reported to predict mortality in cardiac patients [12]. Williams et al. found that a higher mortality rate was associated with income [13]. It has been suggested that impaired autonomic function and lower heart rate variability may be a link between low social position and heart disease [14]. Being married has been associated with a lower risk of mortality in some studies examining community samples [15-17]. Religion or spirituality was found to protect against cardiovascular disease [18-20]. Self-efficacy has been found to predict the physical function, social, and family function in patients with CHD [21]. A gradient relationship was observed between the levels of anger and the risk of coronary heart disease [22-23]. Living alone was a bad prognostic factor after MI [24]. In a case-control study in Bangladesh [25], it was found that patients with the first attack of myocardial infarction reported 2.3 times as many psychosocial stressful events as the control patients.

Stress and DM

Diabetes mellitus (DM) is typified by an inability to sustain appropriate glucose homeostasis [26]. Type 2 diabetes is a major public health problem, with the world prevalence among adults estimated to be 6.4% in 2010. By 2030, it is expected that the burden of diabetes will affect more than 439 million adults worldwide, or 7.7% of the global population. Over the next 20 years, the developed world will see an increase of 20% in the number of adults living with diabetes, and developing countries will see a rise of 69% [27]. Stress is recognized to have a direct and indirect relationship with diabetes [28-29]. According to numerous studies, diabetes may induced by stress [30-34], and several hormones, including cortisol, are known to be involved [33]. Emotional stress, eating disorders, and depression make it harder to regulate oneself, and they can have negative consequences on glycemic control and lead to complications [35]. Basic health education regarding diabetes should be delayed until the patient can manage their stress because extreme stress can hinder the patient's capacity to benefit from it [36]. Animal research suggests that stress affects the onset of type I diabetes. Animals that were partially pancreatectomized surgically have been shown to develop diabetes after restraint stress [37]. Henry Maudsley observed that diabetes often followed the occurrence of a sudden trauma [38]. Walter B. Cannon provoked stress-induced hyperglycemia in normal cats [39]. According to research, people with diabetes are more likely to experience a significant loss in their family before their symptoms appear. [39-42]. According to Hinkle et al., following stressful psychiatric interviews, diabetes patients showed increases in blood glucose and ketones [43-45]. Bradley reported that noise

stress increased or decreased blood glucose in hyperglycemic or hypoglycemic diabetic subjects, respectively [46]. Mikat et al. [47] have shown that stress may play a role in the expression of hyperglycemia in animals. Grant et al. [48] suggested a relationship between life events and changes in type II diabetic symptoms. They suggested that there may be life-event-responsive diabetic patients. Surwit et al. [49] have shown that the degree of hyperglycemia is dependent on the animal exposed to stressful environmental stimuli.

Stress and Stroke

The World Health Organization stated that stroke killed 5.7 million people and 16 million first-time incidents in 2005; by 2030, these figures could rise to 7.8 million and 23 million, respectively [50]. Stroke ranks fourth in terms of lost productivity and is the second most common preventable cause of death globally [51]. Many studies confirmed that Stroke is highly associated with stressful life events. A positive association was found for high levels of neighbourhood cohesions in one study [52]. In most studies, stress is considered chronic when the psychological or physical response to stressors persists for at least 6 months [53]. This stress is directly related to an increase in cerebrovascular disease risk by increasing excessive sympathomimetic activity [54]. Riley et al. [55] reported from the Chicago Health and Aging Project and found that a high association between distress and stroke was found only for haemorrhagic stroke. Although only a few studies have examined the relationship between stress and the incidence of stroke, evidence indicates that stress is a significant risk factor for stroke [56-59]. Among 20,627 participants in the UK EPIC-Norfolk experiment, who were aged 41–80 years, the risk of stroke for a one standard deviation decrease in the Mental Health Inventory (MHI-5 scale) score (showing greater emotional distress) [60]. In addition, using the general health questionnaire to measure psychological distress, Middle-aged men (45–59 years old) who participated in the Caerphilly trial were shown to have a greater risk of fatal ischemic stroke (45%), but not of nonfatal stroke. [61]. Moreover, evidence indicates that self-perceived psychological stress was linked to an increased risk of stroke [62]. According to one study, employment strain and occupational stress even doubled the chance of stroke [63]. It was found In a systematic review of 26 studies, psychological distress was a significant trigger of ischemic stroke [64]. Kornerup et al. showed that older adults who have experienced a greater number of life events are at a higher risk of stroke [65]; Furthermore, they found that within a month of the event, recent stressful life events are associated with incident stroke [66]. Incident stroke has also been linked to earthquakes observed in the Hanshin-Awaji earthquake [67]. Socioeconomic status as a stressor also affects the incidence and mortality of stroke [68-70]. The incidence of stroke is higher in those with lower socioeconomic status [69]. In 2000-2008, the stroke incidence rates in low to middle income countries have exceeded high-income countries by 20% [71]. According to a meta-analysis by Huang Y et al. (2015), women, in particular, were more likely to have a stroke if they worked in high-stress occupations [72].

Stress and Depression

Depression is the most important psychiatric illness. The 12-month prevalence in the community is around 2– 5%. According to various research, the lifetime rates range from 4 to 30%. Rates of major depression are about twice as high in women as in men [73]. Adverse early experiences may affect the development of the hypothalamic-pituitary-adrenal (HPA) axis and the later development of depression. A lack of social support is one of the current life occurrences that frequently triggers depressive disorders. Early life experience and personality may modify the impact of life events [74]. Childhood deprivation predisposes to depressive disorders in adult life. Late-life depressive disorder is associated with parental separation, particularly divorce [75]. It appears that non-caring and overprotective parenting styles are associated with depression in adulthood. Abuse, both physical and sexual, raises the risk of starting major depression [76]. Mothers with postnatal depression associated with neglect and emotional indifference will increase the risk of depression in the subsequent generation [77]. Many researches have shown that: 1. Stressful life situations are six times more common in the months preceding the beginning of depressive disorder. 2. Suicide attempts are also associated with stressful life events 3. 'Loss' and 'threat' events are associated with depression and anxiety, respectively. 4. Life events are important antecedents of all forms of depression [73]. Things that cause feelings of humiliation and entrapment are associated with the start of depression [78]. Some studies have been carried out in Bangladesh to find the relationship between stressors and psychiatric disorders. A case-control study [79] reported that depressed patients had two and half times as many psychosocial stressors as control patients

Bangladesh is a densely populated country, and there is no systematic stress evaluation system. No nationwide survey on stressful life event factors has yet been conducted in Bangladesh. There is a paucity of literature on stress in Bangladesh. Since information about psychosocial stressors of depression, Diabetes mellitus, Stroke, and Ischaemic heart disease is totally lacking, the researchers feel these are very important issues from psychiatric and medical points of view. Hence, this study is designed to disseminate information and to launch an intensive effort to identify and adequately manage the psychosocial stressors of Bangladeshi adults suffering from depression, Diabetes mellitus, Stroke, and Ischaemic heart disease.

Methodology

The descriptive type of cross-sectional study was carried out in the Department of Psychiatry, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, during the period from July 2017 to June 2018. A total of 200 samples (Fifty patients from each department) were taken from the Department of Psychiatry, Cardiology, Endocrinology, and Neurology of BSMMU. A psychiatric and medical diagnosis of each case was confirmed clinically in the presence of the consultant of the respective department. Those patients who were non-communicable and did not give consent were excluded from the study. After obtaining informed consent, patients of both sexes, aged 18 and above, were asked to complete the socio-demographic Questionnaire and Dhaka Stress Scale-Adult version (DSS-A) [80]. Stressful life events of DSS-A were marked as experienced in the last year prior to the onset of the disease.

Results

Sample Characteristics

A total of 200 patients (50 patients from each department) were enrolled in the study. Age ranged from 19 to 80 years with a mean of

Table 1: Comparison of the number of life events experienced in the last year among patients with Ischaemic Heart Disease, Diabetes Mellitus, Stroke, and Depression (n=200).

Characteristics	Mean of number of life events in IHD	Mean of number of life events in DM	Mean of number of life events in Stroke	Mean of number of life events in Depression
Age				
18-20	4.5	-	-	4.3
21-30	3.85	-	-	4
31-40	4.12	3.6	4	4.2
41-50	4.41	3.2	3.5	5.7
≥51	4.6	4.2	3.1	4.3
	4.22(SD=1.8)	3.58(SD=1.8)	3.3 (SD=1.8)	4.5(SD=1.5)
Sex				
Male	3.8	3.2	3	4
Female	5	4	4.1	4.8
Male: Female	1: 1.3	1: 1.3	1: 1.4	1: 1.2
Marital status				
Unmarried	3.65	5	-	4.2
Married	4.2	3.4	3.2	4.6
Separated	3.5	3	3	-
Divorced	5	4.7	3.8	5.2
Widow/widower	5.5	5	3.4	5
Habitat				
Urban	4.2	3.7	3.2	4.3
Rural	4.2	3.2	3.5	4.9

35.8±10.8. The majority of the patients were in the 41-50 age group, constituting 34.5% of the study population, followed by 25.5% in the 31-40 age group. Minimum patients (2.1%) were in the 18-20 age group. Out of 200 patients, 103 (51.5%) were male and 97 (48.5%) females. Male to female ratio was 1.1:1. It was found that 18 (9%) patients were unmarried, and 149 (74.5%) patients were married. Most of the patients, i.e., 81.5%, came from the nuclear family, and 18.5% came from the joint family. It was also found that 129 (64.5%) patients came from urban backgrounds and 71 (35.5%) patients from rural backgrounds. There were 188 (94%) Muslim patients and 11 (5.5%) Hindu patients. The educational status of 22 (11%) patients was at the primary level, 45 (22.5%) at the secondary level, 44 (22%) at the higher secondary level, and 71 (35.5%) at the graduate and above level. Only 18 (9%) patients were illiterate. Among the 200 patients, there were 512 (6%) patients were unemployed, 24 (12%) retired, 68 (34%) housewives, 14 (7%) farmers, and 23 (11.5%) businessmen. However, 52 (26%) patients were service holders.

Comparison of Number of Life Events

A comparison of the numbers of life events experienced in the last year prior to the onset of disease by patients with Ischaemic heart disease**,** Diabetes Mellitus, Stroke, and Depression is delineated in Table 1. The mean of the total number of life events experienced by these patients was 4.22(SD=1.8), 3.58(SD=1.8), 3.3(SD=1.8), and 4.5(SD=1.5) in IHD, DM, Stroke, and Depression, respectively. Of the four groups, male patients with depression experienced the highest number of life events, with a mean of 4. It was 3.8, 3.2, and 3 in IHD, DM, and Stroke, respectively. Among the four groups, female patients with IHD experienced the highest number of life events, with a mean of 5. It was 4, 4.1, and 4.8 in DM, Stroke, and depression, respectively.

Comparison of Mean Stress Scores

Mean stress scores according to Socio-demographic status are shown in Table 2. It was found that the 51 and above age group of DM experienced the highest stress (MSC=322) than the other age groups, followed by the same age group of IHD (MSC=318). Female patients with Depression perceived more stress (MSC=364) than IHD, DM, and Stroke. Similarly, male patients with Depression perceived more stress (MSC=286) than IHD, DM, and Stroke. However, Illiterate patients and patients having a primary level of education with Depression experienced the highest level of stress than all other groups (MSC=440 and 377, respectively). According to marital status, Divorced patients with Depression perceived the highest stress (MSC=458) than all other groups, followed by widows/widows with

Table 2: Comparison of mean stress scores according to Socio-demographic status among patients with Ischaemic Heart Disease, Diabetes Mellitus, Stroke, and Depression (n=200).

Groups	Characteristics	MSC* in IHD	MSC in DM	MSC in Stroke	MSC in Depression
Age	18-20	-	-	-	253
	21-30	292	-	-	294
	31-40	302	263	306	316
	41-50	316	248	276	316
	≥51	318	322	235	312
Sex	Male	280	235	250	286
	Female	354	303	273	364
Education	Illiterate	342	356	240	440
	Primary	205	115	235	**377**
	Secondary level	366	262	251	289
	Higher secondary level	299	197	274	343
	Graduate and above	290	313	246	323
Marital status	Unmarried	259	374	-	250
	Married	305	257	249	338
	Separated	258	244	208	-
	Divorced	345	420	316	458
	Widow/widower	436	346	232	386
Habitat	Urban	316	288	253	313
	Rural	292	232	275	367

*MSC: Mean Stress Score.

Table 3: Comparison of categorization of study population according to level of severity of stress in patients with Ischaemic Heart Disease, Diabetes Mellitus, Stroke, and Depression (n=200).

Category	No. of patients (%) in IHD	No. of patients (%) in DM	No. of patients (%) in Stroke	No. of patients (%) in MDD	Total
Mild stress	6 (12%)	12 (24%)	13 (26%)	3 (6%)	34 (17%)
Moderate stress	17 (34%)	16 (32%)	17 (34%)	17 (34%)	67 (33.5%)
Severe stress	27 (54%)	22 (44%)	20 (40%)	30 (60%)	99 (49.5%)
Total	50 (100%)	50 (100%)	50 (100%)	50 (100%)	200 (100%)

IHD (MSC=436). Depressed patients living in rural areas faced the highest stress (MSC=367), followed by patients of IHD living in urban areas (MSC=316).

Comparison of Study Population According to Severity of Stress

Table 3 shows the study populations categorized according to the severity of stress reported by the patients with IHD, DM, Stroke, and Depression in the year prior to the onset of the disease. There were 34 (17%) patients in the mild stress category, followed by 67 (33.5%) patients in the moderate stress category and 99 (49.5%) patients in the severe stress category.

Total Number of Stressful Life Events

Study populations, categorized according to the total number of stressful life events reported by the patients with IHD, DM, Stroke, and Depression in the year prior to the onset of the disease, are shown in Table 4. There were 227 (29%) stressful life events reported by depressed patients, followed by 212 (27%) SLEs by patients with Ischaemic Heart Disease, 180 (23%) SLEs by patients with Diabetes Mellitus, and 165 (21%) stressful life events reported by stroke patients. Stressful life events are more common in women than in men with depression, with a male: female ratio of 1:2.6. Overall ratio of four diseases was 1:1.2.

Comparison Mean Stress Score

Comparison of stress score in patients with Ischaemic Heart Disease, Diabetes Mellitus, Stroke, and Depression in the year prior to the onset of disease are presented in Table 5. Total stress scores ranged from 33 to 680, with the highest mean of 339 (SD=125.7) reported by patients with depression, followed by 307 (SD=142) mean stress score perceived by patients with Ischaemic Heart Disease and 274 (SD=152) by diabetic patients. However, the lowest mean stress score experienced by patients with stroke was 252 (SD=143.5).

Table 4: Total number of stressful life events reported by patients with Ischaemic Heart Disease, Diabetes Mellitus, Stroke, and Depression in the last year(n=200).

Category	Male (%)	Female (%)	Male: Female	Total (%)
Total No. of SLEs* in IHD	120 (34.3%)	92 (21%)	1.3:1	212 (27%)
Total No. of SLEs in DM	67 (19.2%)	113 (26%)	1:1.7	180 (23%)
Total No. of SLEs in Stroke	100 (28.5%)	65 (15%)	1.5:1	165 (21%)
Total No. of SLEs in MDD	63 (18%)	165 (38%)	1:2.6	227 (29%)
Total	350 (100%)	435 (100%)	1:1.2	784 (100%)

*SLEs: Stressful Life Events.

Table 5: Comparison of stress score in patients with Ischaemic Heart Disease, Diabetes Mellitus, Stroke, and Depression in the last year (n=200).

Category	Minimum	Maximum	Mean ± SD
IHD	46	594	307 ± 142
DM	33	641	274 ± 152
Stroke	33	637	252 ± 143
MDD	111	680	339 ± 125

A one-way ANOVA was performed to evaluate the relationship between mean stress score and the onset of diseases (Ischaemic Heart Disease, Diabetes Mellitus, Stroke, and Depression). The ANOVA was significant at the .05 level, F (3, 196) = 3.3.32, p = .021. A post hoc Tukey HSD test indicated that the mean stress score of the Depressed group was significantly higher than that of the Stroke group (p = [.021]). However, there were no significant differences between the mean stress score of the IHD and DM groups (p = [.651]) and between the Stroke and IHD group] (p = [.295]) or between the MDD and IDH group (p = [.662]).

Discussion

The emergence of psychological distress has long been associated with stressful life situations. Stressful life events have been linked to the subsequent development of mental and physical illnesses, according to numerous international research. Studies have also looked at symptom severity and stressful life events. Several authors have investigated the relationship between stressful life experiences and susceptibility to mental and medical disorders in an effort to prove a causal relationship between these events and the emergence of mental and medical illnesses. So, the purpose of the study was to identify the stress and the level of severity of psychosocial stressors in patients with Ischaemic Heart Disease (IHD), Diabetes Mellitus (DM), Stroke, and Depression.

In this study, we were able to identify certain gender-specific stressors. The frequencies of the 58 specific types of life events listed in the Dhaka Stress Scale [85] were analyzed in IHD. Certain events, such as no. 5, 13, 35, 38, and 43, could, by definition, be assessed only in male patients. Similarly, Item No. 53 could be evaluated only in females. The events that were significantly more likely in the last year prior to the onset of IHD in men were Item no. 1, 6, 9, 17, 22, 24, 26, 27, 36, 39, and 50. Women were significantly more likely to report problems related to Items No. 18, 30, 34, and 47. Both males and females more or less equally perceived the rest of the items. A total of 120 stressful life events were reported by male and 92 by female patients in the year prior to the onset of IHD. The events that male DM patients perceived more were Item no. 2, 27, and 58. Women were significantly more likely to report problems related to Item no. 3, 6, 12, 16, 19, 22, 26, 39, 45, 50 and 52. A total of 67 stressful life events were reported by male and 113 events by female DM patients. The events that male Stroke patients significantly experienced were Item no. 9, 10, 12, 16, 17, 21, 22, 24, 34, and 47. Women significantly reported problems related to Item no. 18. A Total of 100 stressful life events were reported by 65 males and by females. The events that male MDD patients significantly perceived were Item no. 4, 31, and 37. Women significantly faced problems related to Item no. 2, 3, 8, 9, 12, 14, 16, 18, 19, 20, 21, 23, 24, 26, 32, 40, 44, 50, 52, and 58 prior to the onset of MDD. Both males and females more or less equally perceived the rest of the items. A total of 63 stressful life events were reported by male and 164 by female MDD patients.

For IHD, DM, Stroke, and Depression, the mean number of life events experienced by these patients was 4.22 (SD=1.8), 3.58 (SD=1.8), 3.3 (SD=1.8), and 4.5 (SD=1.5), respectively, in our study. With a mean of four, male depressed patients had the most life events out of the four groups. In IHD, DM, and stroke, it was 3.8, 3.2, and 3, respectively. With a mean of five life events, female IHD patients had the most of any of the four groups. For DM, stroke, and depression, it was 4, 4.1, and 4.8, respectively. These figures suggest that in our population, the average individual experiences an average of three to five stressful life events in the last year before having these four diseases.

The age group of DM who were 51 years of age and older had the most stress (MSC=322) compared to the other age groups. This was followed by the same age group of IHD (MSC=318). Compared to IHD, DM, and stroke, female patients with depression reported higher levels of stress (MSC=364). Similarly, compared to IHD, DM, and stroke, male patients with depression reported higher levels of stress (MSC=286). However, compared to all other categories, individuals with depression and those with only a primary level of education had the highest levels of stress (MSC=440 and 377, respectively). In terms of marital status, widows/widows with IHD (MSC=436) and divorced patients with depression (MSC=458) reported the highest levels of stress compared to the other groups. The highest stress levels were experienced by depressed patients in rural regions (MSC=367), followed by IHD patients living in urban areas (MSC=316). Populations in this study were divided into groups based on how much stress the patients experienced in the year before the disease started. A total of 34 patients (17%) fell into the mild stress category, followed by 67 patients (33.5%) in the moderate stress category and 99 patients (49.5%) in the severe stress category.

There were 227 (29%) stressful life events (SLEs) reported by patients with depression (Male=63, Female=165), 212 (27%) by patients with ischemic heart disease (Male=120, Female=92), 180 (23%) by patients with diabetes mellitus (Male=67, Female=113), and 165 (21%) by patients who had a stroke (Male=100, Female=65). The ratio of men to women who suffer from depression is 1:2.6, meaning that women are more likely than males to experience stressful life events. Four diseases had an overall ratio of 1:1.2. So, the numbers of life events endorsed by patients were significantly higher in men in IHD and Stroke than in women. It was reversed in Depression and Diabetes Mellitus.

A comparison of the mean stress score (MSC) in the year before the onset of depression, diabetes mellitus, stroke, and ischemic heart disease was also conducted. Overall stress scores varied from 33 to 680, with patients with depression reporting the highest mean of 339 (SD=125.7), followed by patients with ischemic heart disease with a mean stress score of 307 (SD=142) and diabetic patients with a mean stress score of 274 (SD=152). Nonetheless, stroke patients had the lowest mean stress score, 252 (SD=143.5). From these data, we can say that patients suffering from depression perceived much higher stress than the other three diseases in our country.

Conclusion

This was the first study in Bangladesh to explore the relationship between psychosocial stressors and the development of Ischemic Heart Disease, diabetes mellitus, Stroke, and Depression. The findings of this study revealed that Stressful life events play an important role in the later development of these four diseases. In addition, we were also able to identify certain gender-specific stressors that are common to our own culture.

Limitations of the Study

Several limitations of the present study warrant consideration: 1. Information on stressful life events was obtained retrospectively and may have been incomplete or biased. 2. We only examined those life events listed in the DSS-A; we did not consider other forms of severe stress. 2. We did not examine the effect of more remote stressful events, such as childhood trauma. 4. We did not examine the role of potential protective factors, such as coping skills.

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Authors Contributions: Authors contributed equally.

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