Lifestyles and their impact on Depression

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Abstract: Depression is a major mental health disease and a leading cause of disability. It is estimated that almost 10% of the world’s population suffer from depression at some time during their life. Major depressive disorder is diagnosed in most patients suffering from depression. It is diagnosed by the presence of a cluster of five symptoms, present within a 2-week period. These symptoms should occur independently of physical illness, normal bereavement, alcohol or drugs: abnormal depressed mood; abnormal loss of interest and pleasure; appetite or weight disturbance; sleep disturbance; disturbance in activity (agitation or slowing); abnormal fatigue or loss of energy; abnormal self-reproach or inappropriate guilt; poor concentration or indecisiveness; and morbid thoughts of death or suicide. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition requires that one of the symptoms should be either a depressed mood or anhedonia (loss of interest or pleasure). Secondary symptoms may be appetite or weight changes, sleep difficulties (insomnia or hypersomnia), psychomotor agitation or retardation, fatigue or loss of energy, diminished ability to think or concentrate, feelings of worthlessness or excessive guilt, and thoughts or actions of suicide. The etiology of depression is multifactorial. Besides the emotional suffering and the social repercussions, depression is often a comorbid condition with several major chronic ailments, like cardiovascular diseases and diabetes mellitus. It deleteriously impacts these ailments and increases premature mortality. Several lifestyle behaviors have a mitigating effect on depression. These include non-smoking, abstinence or low to moderate alcohol intake, a normal body mass index, avoidance of sedentary behavior and regular exercise, and eating a healthy diet. These lifestyles also favorably impact other co-existing diseases.

Keywords: Depression, MDD, lifestyles, diet, alcohol, smoking, obesity, exercise.

INTRODUCTION

Depression is a common mental health disease [1] affecting approximately 4.4% of the global population or more than 350 million people [2, 3]. It is increasing in incidence - the number of incident number of depression cases worldwide increased by 49.86% from 1990 to 2017 [4]. The lifetime prevalence in the general population is estimated to be 10% [5]. Women are at twice the risk of suffering from depression irrespective of their nationality, ethnicity, or culture [6]. Depression is a leading cause of disability [7] – the global burden is about 3% of the disability-adjusted life years [8]. Depression is expected to become the leading cause of disability in the world by 2030 [9]. Major depressive disorder is diagnosed by the presence of a cluster of five symptoms, present within a 2-week period [10]. These symptoms should occur independently of physical illness, normal bereavement, alcohol, or drugs: abnormal depressed mood; abnormal loss of interest and pleasure; appetite or weight disturbance; sleep disturbance; disturbance in activity (agitation or slowing); abnormal fatigue or loss of energy; abnormal self-reproach or inappropriate guilt; poor concentration or indecisiveness; and morbid thoughts of death or suicide [10]. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition requires that one of the symptoms should be either a depressed mood or anhedonia (loss of interest or pleasure) [10]. Secondary symptoms may be appetite or weight changes, sleep difficulties (insomnia or hypersomnia), psychomotor agitation or retardation, fatigue or loss of energy, diminished ability to think or concentrate, feelings of worthlessness or excessive guilt, and thoughts or actions of suicide [10].

Depression inflicts significant emotional suffering [11]. It is often a comorbid ailment with cardiovascular diseases [12, 13]. It is also closely associated with several other conditions, including...
anxiety [14], dementia [15], diabetes mellitus [16], Parkinson’s disease [17], epilepsy [18], pain disorders [19], several cancers [20], osteoporosis [21], and irritable bowel syndrome [22]. It prognosticates a poorer course of these diseases, increasing premature mortality [23, 24]. It promotes suicidal behavior [25]. Depression increases health service utilization and is associated with significant medical costs [26].

**DISCUSSION**

Healthy lifestyles include non-smoking, abstinence or low to moderate alcohol intake, a normal body mass index, regular exercise, and a prudent quality of diet [27]. Tobacco smoke has several thousand chemicals, and many of them are carcinogenic [28]. Smoking has been causally related to several major diseases [29], including cardiovascular diseases [30], COPD [31], and cancer [32]. It is harmful to the mother and the offspring if pregnant females smoke [33]. Secondhand smoke exposure is also harmful to health [34]. Smoking cessation reduces the risk and severity of major chronic diseases [35, 36]. It improves the quality of life [38] and reduces mortality [39]. Smoking is the leading preventable cause of death worldwide [40, 41]. Alcohol has been found to be protective for some diseases if it is taken in moderation – not to exceed two standard drinks a day for men and one standard drink a day for women [42]. However, heavy drinking (intake, of >60 g/day in men and >40 g/day in women) [43], is harmful to health [44, 45]. Alcohol use disorder (AUD) [46] is also associated with increased violence, accidents, suicide, and a higher mortality [47, 48]. Obesity is described as having a body mass index (BMI) >30kg/m2 [49]. It is prevalent all over the world [50-56]. Visceral obesity is also important [57, 58] because as compared with subcutaneous fat, white visceral fat secretes harmful free fatty acids and adipokines [59, 60]. Visceral obesity can be measured by several anthropometric measurements: waist circumference <102 cm in males and <88 cm in females, waist-hip ratio 0.9 or less in males and 0.85 or less in females, weight height ratio <0.5 [61, 62]. Physical activity has innumerable health benefits [63]. The World Health Organization recommends that adult men and women should accumulate at least 150 min of moderate-intensity physical exercise per week and young people aged 5–17 years should accumulate at least 60 min of physical exercise of moderate to vigorous intensity daily [64]. Besides calorie observation to avoid obesity, the quality of diet is important [65]. The dietary guideline for Americans recommends that the diet be well balanced, mostly plant-based, rich in fruits and vegetables, whole grains, fish, low in sugar and salt, and with the occasional intake of lean meats [66]. It should limit or eliminate trans-fats, saturated fats, fried foods, sodium, red meat, refined carbohydrates, and sugar-sweetened beverages [66].

**Smoking**

Smokers die early [67]. Amongst mental health disease individuals, who tend to smoke more face a reduction in lifespan - this reduction may be 10-18 years [68, 69]. Depressed people are more likely to smoke [70, 71]. Patients with depression start smoking at an earlier age [72], smoke more heavily [71, 73-75], are more likely to smoke more with increasing/persistent depression [76], are more likely to become nicotine dependent [77], and are less likely to succeed in cessation [78, 79]. It is hypothesized that smoking may help alleviate symptoms of depression, and hence the increased habit in these patients [80-83]. Depression and smoking often co-exist [84] and this connection is bidirectional [85-87]. Not only depressed individuals smoke more, as discussed above, but smoking can also induce depression [88]. People who smoke are more likely to become depressed [89]. In a study of several thousand adolescents, current cigarette use appeared to be associated with the development of depressive symptoms [90]. In a population-based study, smoking was associated with increased odds for major depressive disorder with an odds ratio (OR)<1.46, while heavy smokers (>20 cigarettes/day) doubled their odds for major depressive disorder [91]. A longitudinal study found a causal association, with smoking causing depression [92]. In a recent analysis of lifestyles involving individuals from four middle-income countries, daily and non-daily smokers were both more likely to become depressed over time [93]. Exposure to secondhand smoke is not safe either [94]. It increases the risk of depression, in children [95], adolescents [96], and adults [97]. Smoking affects the regulation of the hypothalamic-pituitary-adrenal system, resulting in hypersecretion of cortisol [98-100]. This interferes with the natural adaptive coping mechanisms and induces depression [101]. Besides the reasons mentioned above, several shared genetic factors have also been found between depression and tobacco use, explaining their comorbidity [102].

**Alcohol**

Alcohol misuse and depression commonly co-occur [103], and the relationship is causal [104]. This relationship appears to be curvilinear, with alcohol abstinence and heavy drinking both being associated with a higher risk of depression [105]. Depression may also lead to alcohol abuse in some individuals [106]. Both conditions are interlinked and in a meta-analysis, Boden and Fergusson concluded that the presence of either disorder doubles the risks of the second disorder [107]. Further, co-existence results in greater severity and a worse prognosis for both disorders than either condition independently [108-110]. Even with tailored treatment, patients with co-morbid alcohol and depression, exhibit more depressive symptoms, than those with depression alone [111]. There appear to be some gender differences between this coexistence [112, 113]. Men appear to develop AUD before depression,
while women develop depression and then appear to progress on to AUD [112, 113].

Obesity

The prevalence of depression in obese individuals is estimated to be twice as high as in those of normal weight [114]. Negative body image and low self-esteem are common in obese patients [115]. They are also more likely to engage in high-risk behaviors such as smoking or consuming alcohol [116]. They often face stigma in social and professional lives [117, 118]. They may also experience functional impairment, such as reduced mobility, resulting in poor health quality of life [119]. These and other factors contribute to the development and persistence of depression in obese individuals [120, 121]. Depressive symptoms may also cause obesity [122-126]. It is estimated that 43% of adults with depression have obesity [127]. The reasons are multifactorial [128-133]. Depressed individuals may be less physically active [128], have shorter night sleep duration [129], and indulge in excessive ‘emotional’ eating [130]. Certain antidepressant medications can also contribute to weight gain [131-133]. The relationship between obesity and depression is therefore bidirectional [134]. The coexistence of these two conditions leads to poorer treatment adherence and poor response to therapy to common co-morbidities like cardiovascular diseases [135]. The coexistence of obesity and depression also leads to higher healthcare costs than either condition alone [136]. The biological pathways include genetic influence [137], HPA axis dysregulation [138, 139], immuno-inflammatory dysregulation [140] and insulin abnormalities [141].

Exercise

Depressed people exhibit higher levels of sedentary behavior [142] and lower levels of physical activity (PA) [143]. The Brazilian National Health Survey, (59,399 individuals), found that a lack of PA for leisure was associated with depression in young males, middle-aged, and older adults [144]. Several studies have documented the protective effects of physical activity on depression [145-151]. Hamer et al., noted that risk reduction for depression was noted at a minimal level of at least 20 min/week of any physical activity, with a greater risk reduction with activity at a higher volume and/or intensity [145]. In a systematic narrative review of 30 prospective cohort studies, Mammen and Faulkner reported that 25 of the 30 studies found that PA resulted in reduced incident depression [146]. Subsequent studies have confirmed the beneficial role of exercise on depression [147-151]. More recently, in a study of 49 studies (266,939 participants), Schuch and Stubbs found that PA lowered the risk of depression by between 17% to 41%, across all ages and in all continents of the world [152]. The effect of exercise is comparable to other first-line treatments for depression [153]. Evidence suggests that both exercise and antidepressant medication may alleviate depression through several processes [154]. These include reduced systemic inflammatory signaling [155] and increased expression of BDNF levels with increases in hippocampal, prefrontal cortex, and anterior cingulate cortex volumes [156-158]. Exercise also improves general physical health, body image, patients coping strategies with stress, and the quality of life in depressed individuals [159]. It also helps them become more independent in activities of daily living [160]. Patients with depression also have a higher risk of type II diabetes [161] and cardiovascular disease [162], and exercise helps reduce the risk of both.

Diet

The detrimental effects of excess body weight on depression can be reduced by weight loss, which can be achieved by a combination of calorie-restricted diet and physical activity [163]. Dietary components also influence depression [164-167]. Unhealthy foods that may aggravate depression include processed and unprocessed red meat [168, 169], saturated fats [170, 171], and high sugar intake [172, 173]. On the other hand, foods such as fruit and vegetables [174, 175] and fish [176] are associated with less depression. Lassale et al., in a review and analysis of 20 longitudinal and 21 cross-sectional studies, concluded that a healthy diet helps reduce depression [177]. A recent meta-analysis also showed that ‘healthy’ dietary patterns (regardless of the type) may contribute to the prevention of depressive symptoms [178]. The relationship between diet and depression appears to be related in a linear fashion [179]. An unhealthy diet is often poor in several micronutrients that are important for mental health [180]. However, supplementation with these is ineffective in reducing depression [181] and could even cause harm [182]. Implicated mechanisms include HPA axis dysregulation [183], increased inflammation [184], disturbed glutamate homeostasis [185], excessive oxidative stress [186], altered neuroplasticity [187], and other dysfunctions [188].

CONCLUSION

Depression is a major health issue. It is a leading cause of disability. It co-exists with many chronic diseases and has a detrimental effect on these. It is associated with an increase in premature mortality. Studies indicate that depression may be prevented or reduced in intensity with the incorporation of several healthy lifestyles. These include abstinence from smoking, low to moderate intake of alcohol, avoidance of obesity, regular exercise, and prudent dietary habits. Besides the benefits on depression, healthy lifestyles also help mitigate several major chronic ailments.

Acknowledgement: None

Funding: None

Conflict of Interest: None
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