

Lifestyle and Physical Condition related factors of Depression among Middle-aged and Older people

Bingyan Wang *

Department of Psychology, University of Pittsburgh, Pittsburgh, PA 15260, USA

* Corresponding Author Email: biw24@pitt.edu

Abstract. This paper offers a general review of the current studies on factors that can contribute to depression as applied to middle-aged and aged adults. With the aging trend of the whole world population, middle-aged and elderly adults' mental health becomes an issue that needs to concern. The diversity of the factors is notable, which means people can prevent depression in several different ways. This paper mainly divided the factors into two parts: lifestyle-related factors and physical condition-related factors. Additionally, lifestyle factors include social isolation (SI), ambient temperature, and smoking. The factors that are related to lifestyle are complex and involve chronic disease, sleep duration, obesity, and muscle strength. SI and smoking positively relate with depression. A negative relationship has been found between depression and ambient temperature. Chronic disease and obesity have a positive relationship with depression. Short-term sleep has a significant effect on depression. Muscle strength negatively relates to depression. Overall, this paper highlights the different factors that are related to depression for people in midlife and aged adults.

Keywords: Depression; Impact factors; Middle-aged adults; Elders.

1. Introduction

Depression is a serious psychological illness all around the world, and it has negative effects on people's daily life. It could be a problem for people in any age group. World Health Organization estimated at least 322 million people suffer from depression [1]. People have 20% possibility to experience a significant depressive time at some point in lifetime since major depressive disorder is very common [2]. As people grow older, middle-aged and older adults begin to lose physical fitness and may even begin to gradually disconnect from society. Their mental health is an important issue that needs to be paid more attention. Depression has garnered more attention among the older age groups because of the aging of the world population. Therefore, it is meaningful to explore how to prevent depression in middle and old age.

This paper will focus on the factors that could contribute to depression for middle-aged and elderly people from two main perspectives: lifestyle and physical condition. The review included research from various countries and provided causes from different cultural backgrounds. Firstly, this paper will discuss lifestyle-related factors such as SI and environmental factors like ambient temperature. Secondly, this paper will focus on physical condition attribution, like chronic illness and sleep duration.

2. Introduction of Depression

Depression is a sub-category of mood disorder characterized by severe or persistent enough sadness, which leads to declined interest in activities in which they initially found pleasure. There is no exact cause for depression, but biological, especially genetic, and environmental factors contribute. Along with a depressed mood, depression also results in cognitive, psychomotor, and other sorts of impairment. Suicidal thoughts and attempts are common in those who suffer from depression. Commonly, mental symptoms or problems coexist (e.g., Anxiety), which can sometimes make diagnosis and treatment more challenging. Depressed middle-aged and elderly persons are more likely than younger adults to express affective and physical symptoms, experience loss of interest and cognitive changes, and attempt suicide [3].

3. Lifestyle-related Factors

Evidence shows that lifestyle is a factor that can lead to depression. Some individuals hardly change their lifestyle, so there are some bad habits that get along with them. As they get older, these bad habits tend to cause depression. SI is one significant factor that could lead to depression in middle-aged and aged adults [4]. SI is referring to a lack of social relations, which suggests that only a small number of social relationships are maintained by individuals. Circumscribed social networks, infrequent social interactions with friends or families, and little involvement in social activities are characteristics of socially isolated individuals. SI also tends to be one factor that damages people's cognitive ability and mental health. One prior study aimed to focus on the relationship between SI and depression among older age group in India. The age of participants were 45 years old and above, including their spouses. This study set 45 years as the lower age limit since it is the onset age of some chronic diseases. After screening by the researchers, data from 63,806 participants were retained and studied. The factors measured by the researchers are cognition, depression, SI, leisure, and demographic determinant, which is age. The constructs of the test for cognition were incorporated from the University of Michigan Health and Retirement Study, including memory, executive function, arithmetic function, and object naming. Each part has its separate score, and the total score is 43. For depression, researchers assessed participants' depressive situations by using the Center for Epidemiologic Depression scale consisting of ten questions and rating by 4-point Likert scale. The measurement of SI includes different perspectives of daily isolation level and is coded by score. The greater the score is, the higher the SI level is. The factor of leisure is the level that the individual involved in leisure activities. The index consisted of 11 questions with a 7-point Likert scale, which assess the frequency that participants engaged in social activities, like hobbies, sports, and outdoor. The demographic determinant is the age limit which is 45 and above. This limit is set to better compare the age difference between middle-aged and elderly adults. Researchers used Stata to analyze data, and results were reported as mean and standard deviations. To determine if the ratings for social withdrawal and leisure are properly distributed, the Shapiro Francia test was used. Results showed that people in middle age and elders both experienced high-level of SI and depressive symptoms. SI and age are significantly related to delayed cognitive functioning and the emergence of depressive symptoms. Researchers found the higher the SI level, the more severe the depression is. Age has a more significant influence on cognitive system than depressive symptoms. Leisure only had a significant relationship with cognition. The results from this study aligned with previous studies. There are still some limitations in this study. Researchers paid too much attention to depression when measuring the factors and neglected the perceived SI. Future study needs to include both objective and perceived SI to examine the relationship. It is hard to establish a causal relationship in this study since the study utilized a cross-sectional research design.

Besides SI, environmental factors could also be attributed to depression, like ambient temperature [5]. Researchers conducted a longitudinal repeated measures designed study, which included participants from 20 cities in China. Communities near the environmental monitoring site have at least 6000 permanent population and a strong willingness to participate and meet the requirements. Random sampling was used to select participants groups from five cluster: 40-49, 50-59, 60-69, 70-79, and 80-89 years old, and total of 3811 individuals from 24 communities were involved in the study after excluding the people who did not meet requirements. Participants were asked to finish the survey (interview and questionnaire) conducted in different seasons. The measurements were repeated three times. For depression, researchers assessed participants' depressive symptoms and tracing the frequency of symptoms in the last two weeks. A score of more than 5 out of 27 was identified as depression in this study. The average of the past 14 days of weather and air pollution data were calculated. A generalized estimation equation model was set up for statistical analysis. Researchers found an almost linear curve when applying a non-linear function to temperature. The potential covariates like age, sex, and marital status were analyzed as a separate dataset. The robustness of the findings was also examined. A linear relationship was found between ambient temperature and depression. Low temperature is related to a higher depression risk than high

temperature, according to the exposure-response connection, which resembled a straight line. The PHQ-9 score rose by 0.115 for every 5 °C decrease in temperature. The results were consistent with previous studies. However, there are still limitations in this study. First, there may be errors in data due to the fact that researchers were unable to account for participants' movements; the estimation of exposure in a location might not accurately reflect real exposure. Second, the study of potential covariates was not enough due to the limitation of the data access. Other covariates, like a family history of mental illness, need further study.

Furthermore, research illustrated an interesting relationship between tobacco use, alcoholism, and depression. Smokers without initial depression are 30% more likely to get depression than non-smokers. People who develop depression are also 41% more likely to smoke. There is a 60% possibility for heavy drinkers to smoke compared with non-heavy drinkers. There is a vicious cycle between these three factors, which could severely damage middle-aged adults' health [6].

4. Physical Condition-related Factors

Middle-aged and older adults have huge changes in physical condition as they get older. It is very common for middle-aged and older people to be at significant risk of chronic illness. Bi et al. (2021) led a four-year followed longitudinal study in China to find the relationship between chronic disease and depression [7]. Chronic diseases are characterized by their long course, complicated causation, social harm, and severe health consequences. They may harm vital organs, which could lead to disabilities, impair work capacity, and lower quality of life. To better supplement previous studies' inadequacies, this study investigates the association between depression and all common chronic diseases. China Health and Retirement Longitudinal Study (CHARLS) is the data resource. The study started in 2011, and participants were tracked every two or three years. This study set 45 years old as the lowest age limit and only included individuals with no depression and clear depression status at baseline. After screening by the researchers, data from 7819 participants were retained. Researchers measured depression, chronic disease, and sociodemographic and other potential covariates. The assessment of depression was incorporated from the Center for Epidemiological Studies Depression Scale (CES-D10). The assessment asked participants about the duration of the situation. Therefore, the scale is divided into 0-3, each number with incremental 2 days. Ten or more scores were identified as depression in this assessment. Researchers formulated 13 types of disease as a baseline for chronic disease, and participants can answer 1 as had disease and 0 as do not have. The scores represented the chronic disease condition of participants. Data like age, body mass index, marriage condition, and smoking status are measured as potential confounders. The t-test and chi-square test were utilized. The risk of sudden depression associated with chronic disease is measured by using the Cox model. Stratified analyses were implemented to examine the association of potential confounders. As a result, during the follow-up period, 2271 people who were at baseline free of incident depression developed depression. The researchers also found that arthritis, hypertension, and stomach or other digestive disorders were the top three most prevalent illnesses, and females who lived in a rural region, shared a home with their spouse, had less schooling, made an average income, and did not smoke or consume alcohol at baseline have a higher likelihood of developing depression. Individuals with depression had a noticeably higher percentage of people who acquired any of the chronic diseases.

The results aligned with previous studies. However, there are some limitations in this study. The first one is information bias since the data was collected by self-report questions, and biased estimation could occur during the process. Secondly, the study time is too short to develop the causal relationship. Thirdly, more investigations are needed to be done on potential confounders, like psychosocial variables.

Besides chronic disease, sleep duration is another factor that contributes to depression [8]. As an important public health topic, sleep is a factor that cannot be ignored. Since this cross-sectional study is also conducted in China, CHARLS is still the main data resource. The lowest age limit is 45 years old, and the sample size was 9529. The researchers mainly measured sleep duration and depression.

Participants were asked to self-report their sleep quality by answering questions about average actual hours for one night. The assessment researchers used was American National Sleep Foundation, which divided sleep time into different categories (short, reference, long). The depressive symptoms were identified by the Chinese version of CES-D. There are ten questions with four points scale in the assessment. A score of 10 was defined as a depression diagnosis score. Data like demographic, socioeconomic characteristics, behavior factors, and health status were measured as potential confounders. Demographic and socioeconomic data included information like age, education level, and annual household income. Smoking and drinking are grouped into behavior factors. Health status is divided into activities of daily living and chronic disease. In this study, researchers used multinomial logistic regression models to analyze data and calculated the relative risk ratios and 95% confidence interval. The t-test and Chi-square test were used to analyze other variables. As a result, a positive relationship can be found between long sleep duration and depression, which means participants who had depression are more likely to experience long-term sleep, but it is not significant. However, there is a significant effect between depression and short-term sleep duration. Also, all subgroups showed significant correlations in the short-term sleep duration group.

There are still limitations in this study. Although there is no significant relationship between long-term sleep duration and depression, long-term sleep is less studied. There is not enough study about long-term sleep, and previous studies focused more on short-term sleep. Therefore, more studies are needed to learn more about long-term sleep duration. In this study, there are 30% of participants excluded during screening, so underestimation may exist in the result. Also, the psychiatric medication that participants used could have an effect on sleep quality, but little data was collected from this perspective.

Obesity is also a factor that could lead to depression in middle-aged adults. Obesity has a serious influence on an individuals' health, and it is diagnosed by BMI, which is great than or equal to 30 kg/m². According to Xiang and an (2015), people who are overweight and have obesity are 13% more likely to develop depression in the future; also, females and non-Hispanic whites showed a larger association between obesity and the onset of depression than did men and racial minority counterparts [9]. There is also one prior study aimed to focus on muscle strength and depression [10]. A 7-year cohort study was conducted in China with overall 32544 participants. After excluding the confounders, the results showed that low muscle was related to a higher incidence of depression. Muscle strength is also a predictive factor for depression, especially upper and lower limb muscle strength.

5. Discussion

In this paper, the present study discussed the factors that contribute to depression mainly from two parts: lifestyle and physical condition. In the lifestyle part, evidence has shown SI, ambient temperature, smoking, and heavy drinking are factors that contribute to depression. The prior study has shown results that SI is negatively correlated with depression. The environmental factor is one that can be neglected, but it is still one of the attributions to depression. Researchers have found a negative relationship between depression and ambient temperature. The incident rate of depression will increase with every 5 degrees decrease. For smoking and heavy drinking, smoking is the primary factor that could lead to depression. However, researchers have found that people who are heavy drinkers are very likely to smoke. Although there is no significant effect between depression and heavy drinking, more drinkers get depression in their later life than non-drinkers. In the physical condition part, evidence has shown chronic illness, sleep duration, obesity, and muscle strength can contribute to depression. Chronic illness is very common in middle-aged and older people. It could affect people's life and health in different ways. Data suggested a significant relationship between depressive symptom and chronic illness, especially for digestive disease, arthritis, and kidney disease. People who have chronic illnesses have a higher possibility of developing depression in their later life. Sleep duration is another physical condition factor. Sleep is the key to people's life; a good

quality of sleep is important to keep high-quality life. Researchers conducted the study, which included both long-term sleep and short-term sleep. The results found that long-term sleep was not related to depression, but there is a significant correlation between short-term sleep and depression.

There are some limitations in these studies. In the SI study, researchers failed to focus on perceived SI and put almost all the focus on objective SI. Future studies can put more attention on both sides instead of only one side. Researchers in ambient study cannot limit their movement, therefore the exposure estimates might not accurately reflect real exposure. Future studies can focus on how to get a more accurate ambient temperature and include more studies on other covariates. In the physical condition part, the chronic illness and sleep duration studies also have limitations. The results in chronic illness data collection could be biased since it is collected by self-report. The answer may not reflect the real situation. Researchers can try to get information from the primary care system to get more accurate information that can reflect the real situation. In sleep duration one, although researchers find no significant effect of long-term sleep on depression, there is a positive relationship found in the data. In previous studies, long-term sleep is always the one that does not get much attention. Therefore, future studies can put more effort into long-term sleep duration and provide more data.

6. Conclusion

In conclusion, this paper mainly discusses the factors that are attributed to depression in middle-aged and elderly adults. This paper divided factors into two big categories, which are lifestyle-related factors and physical condition-related factors. Under lifestyle, main factors include SI, ambient temperature, and smoking. People who experience more SI have a higher possibility of getting depression. The decrease in ambient temperature is positively associated with the incidence of depression. Individuals who smoke are more likely to develop depression. Under physical condition one, the main factors are chronic disease and sleep duration. People who have chronic diseases have a higher possibility of developing depression in their later life. A positive relationship has been showed between depression and short-term sleep. However, it is hard for these studies to develop a causal relationship; future research could further refine the manipulation of the relevant variables to allow for more in-depth studies. Overall, lifestyle and physical condition are two perspectives that people can pay attention to prevent depression in middle-aged and elderly age population.

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