

Depression Update and the Role of Nutritional Intake in Symptoms of Depression Experienced by Young College Students

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Abstract

The objective of this study was to present an update on young adults' depression in the United States and examine the role of nutritional intake of college students as a mediating variable in gender and depression relationship. Three hundred and five first- and second-year undergraduate students from an American regional southwestern university were administered the Demographic Questionnaire, Nutritional Intake Questionnaire (NIQ), and Beck Depression Inventory (BDI). Of these 305 undergraduates, 116 met the research criteria for the study (18 - 26 years of age, middle-upper classes, not under treatment for depression or any other psychological disorder; not having any food restrictions, falling in the healthy/poor nutritional intake categories). A 2×2 (nutritional intake x gender) factorial Analysis of Variance results showed significant main effects of nutritional intake and gender on depression and a significant interaction between nutritional intake and gender with regard to students BDI scores. The post hoc pair wise comparisons revealed that only women with poor nutritional intake had significantly higher BDI mean score than men with healthy or poor nutritional intake and women with healthy nutritional intake. It was concluded that the variable of nutritional intake is an important variable to consider because it might be a mediating variable between the gender and depression link and that a poor nutritional intake might be a risk factor for depression in young college women. Furthermore, when the nutritional intake is healthy, young college men and women tend to experience only minimal symptoms of depression and two groups do not differ significantly in their depression levels.

Keywords: Depression; Women's depression; Men's depression; Nutritional intake; Healthy diet; Poor diet

Introduction

Depression in the United States is a common condition and has been referred to as the common cold of mental health^[1]. It involves extreme sadness or irritability, loss of interest or pleasure (anhedonia) in daily activities, sleep disturbance, appetite changes, poor concentration, low energy, low self-esteem, and increased morbidity and mortality. Problems with interpersonal relationships are common and potential for suicide is significant. Further, major depression can render one incapacitated^[2-5]. In young adults who suffer from a depressive disorder, lack of desire to do anything can lead to academic and employment difficulties. Unfortunately, depression is the number one reason for dropping out of college as well as for suicide^[2,6].

Symptoms of depression are wide spread on college campuses and much of the depression research has used college students as subjects^[7]. The spring 2015 national survey of 93,034 students from 108 colleges in the United States showed that within a 12 months period, 63.9% of the students (54.2% men and 68.5% women) reported feeling very sad, 34.5% (29.8% men and

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36.6% women) reported feeling so depressed that it was difficult to function. Of this sample of students, 13.1% (8.9% men and 14.9% women) were diagnosed or treated by a professional for depression^[8]. The depression prevalence rate of 13.1% among young college students is almost double as compared to the prevalence rate in general population which is a serious cause for concern. An estimated 6.7% of all adults (15.7 million adults) aged 18 or older in the United States were reported to have at least one major depressive episode in the 12-month period^[9]. In addition, the 12-month prevalence data showed that 8.9% (8.3% men and 9.0% women) reported seriously considering suicide, while 1.4% (1.4% men and 1.4% women) reported attempting suicide^[8]. In the United States, suicide is the third leading cause of death in young adults with men committing suicide at five times the rate of women even though young women attempt suicide more often^[6].

In order to prevent both chronic physical and mental diseases, U.S. Department of Health and Human Services launched the Healthy People, 10-year national initiative for improving the health of all Americans. Building on three decades of science based work, Healthy People 2020 is the fourth generation of this initiative. The Healthy People 2020 objectives about college students are geared toward setting health objectives which can motivate college students and monitor the progress. In spring 2009, 117 institutions were surveyed by the American College Health Association and 87,105 students responded to the National College Health Assessment (NCHA). One of the objectives of the Healthy People 2020 is to “Increase the proportion of college and university students who receive information from their institution on suicide.” Of 87,105 undergraduate students, only 29.2% (2009 baseline) reported that they had received information from their college or university on suicide. The goal is to increase it to 32.1% in 2020 (10 percent improvement^[10]). Gender is an important variable to consider in any study of depression because women seem to have twice the risk for developing depression as men. Consistent research evidence has supported the gender differences in depression for the last three decades^[11,12]. There are numerous hypotheses for this difference, but the most enduring ideas given are women’s willingness to express depressive symptoms, stronger genetic predisposition, fluctuating hormone levels, being more ruminative, being more invested in relationships, and being more likely to seek a diagnosis^[12,13]. In a more recent debate over this issue of gender differences in depression, the researcher Mule vehemently contended that a definite answer cannot be found and that there is no way to pinpoint why there is a gender difference in depression^[12]. Thus, the search for answers continues.

Contributing factors to student depression are identified as poor sleeping and eating habits, lack of exercise, and academic stress^[6,7,14]. Poor nutritional intake is often the most overlooked cause of depression in college student. Several studies have reported poor dietary habits of college students e.g.,^[15-20]. Recently the 2015-2020 edition of the Dietary Guidelines reported low levels of progress toward meeting the recommended dietary guidelines for Americans. The Dietary Guidelines is required under the 1990 National Nutrition Monitoring and Related Research Act^[21]. It states that the U.S. Departments of Health and Human Services (HHS) and Agriculture (USDA) must jointly publish every 5 years a nutritional and dietary information report and guidelines for American public. The 2015-2020 edition

of the Dietary Guidelines is designed for professionals to help all Americans, 2 years and older, to consume a healthy, nutritionally adequate diet^[21]. The guidelines also highlight the need to improve dietary education and behaviors in the United States. The Healthy People 2020 also had another health objective for the young college students: “Increase the proportion of college and university students who receive information from their institution on unhealthy dietary patterns.” Of the 2009 sample of 87,105 students, 52% (2009 baseline) reported that they received the information on unhealthy dietary patterns and the target of the Healthy People 2020 is 57.2% (a 10% improvement)^[10].

Both depression and poor nutritional intake have been recognized as major problems of young college students and they have been empirically studied in relation to many aspects of student life. However, little research has focused on assessing the relationship between nutrition and depression^[22]. In this regard, a few studies have focused on elderly or young children and overlooked the young adult population of college age^[23]. Others have examined the excess or deficiency of some specific micronutrients in people’s diet leading to depression. Deficiencies and excesses of certain micronutrients can result in a depressive state^[24]. For example, excessive fat is a big risk factor for depression^[25]. Deficiencies of thiamine (vitamin B1), riboflavin (vitamin B2), pyridoxine (vitamin B6), ascorbic acid (vitamin C), choline, and folic acid have been linked to depression and apathy in some individuals^[26-30]. Also, research has shown an association between refined carbohydrates and depressive state. People who crave carbohydrates and suffer mood fluctuations tend to be susceptible to clinical depression^[31,32]. Therefore, persons who eat a lot of processed foods, frozen dinners, junk foods on the run, or follow very low calorie diets may be shortchanging their bodies of needed nutrients^[33]. Many young college students tend to follow this eating pattern.

As presented above, depression and nutritional intake of young college students have been separately examined by researchers. However, no study to the best of our knowledge has examined the role of nutritional intake of college students in depression, and more specifically as an intervening variable in gender and depression link which has intrigued researchers for several decades. Therefore, by controlling the variables of age (18 - 26) and socioeconomic status (middle-upper classes), and using only those participants who were not under treatment for depression or any other psychological disorder and did not have any food related restrictions, we attempted to examine the role of nutritional intake in depression of young college men and women. The nutritional intake was measured by the Nutritional Intake Questionnaire (NIQ)^[34] and depression was measured by the Beck Depression Inventory (BDI)^[35].

Methods

Participants

A total of 305 first- and second-year undergraduate volunteers from psychology classes at an American regional southwestern university were administered the demographic questionnaire, NIQ, and BDI. Of these, 116 students met the research criteria for this study of age (between 18 and 26 years old), socioeconomic status (middle and upper classes), healthy/poor nutritional intake (scoring on NIQ as + 21 to + 89 and -11 to -84 respectively), not under treatment for depression or any

other psychological disorder, and not having any food related restrictions at the time of the study. After exercising these controls, the study sample which was predominantly Caucasian (75%) consisted of 22 men with healthy nutritional intake, 22 men with poor nutritional intake, 47 women with healthy nutritional intake, and 25 women with poor nutritional intake.

Instruments

An informed consent form was signed by all participants. A demographic questionnaire was used requesting information regarding age, gender, socioeconomic level, currently diagnosed with any psychological disorder/receiving treatment/using any psychotropic medication, and any food related problems or restrictions etc. The NIQ was used to measure an individual’s nutritional intake. It consisted of 30 multiple-choice questions ranging in topics from frequently consumed foods to nutritional values. The scores range from - 84 to + 89 that allow assigning levels of very healthy nutritional intake to poor nutritional intake of individuals. The ranges for the NIQ are as follows: +21 to +89 represents healthy nutritional intake, + 20 to -10 represents the normal range, and - 11 to - 84 represents poor nutritional^[34]. Participants scoring + 20 to -10 were removed from the current sample to enhance the contrast between healthy nutritional intake and poor nutritional intake groups.

One of the most widely used tests of severity of depressed mood; BDI (1A) was used in this study. It consists of 21 items designed to assess cognitive, affective, and behavioral distress. Items are rated on a 4-point scale indicating degree of severity (0- not at all to 3-extreme form of each symptom). The interpretation ranges are 0–9 (minimal depression), 10 – 16 (mild depression), 17-29 (moderate depression) and 30–63 (severe depression). Cronbach’s α was reported as 0.92 for outpatients and 0.93 for college students. For college students, test-retest correlations ranged as 0.64 – 0.90^[35,36]. Currently BDI-PC is available for onscreen administration from Pearson Assessments. BDI can be used with psychiatric and non-psychiatric populations which makes it a very useful measure of depression^[37].

Procedure

After the approval of the study by the University Institutional Review Board, with professors’ permission, 305 first- and second-year undergraduate volunteers were contacted in the classrooms and were informed about the nature of the study. They were asked to sign and return the consent form before they completed the demographic questionnaire, NIQ and BDI. The returned questionnaires were coded and demographic questionnaires were used to screen the participants for the study. Of the 305 surveyed students, 116 met the research criteria for the current study.

Results

Participant’s scores on the BDI ranged from 0 to 25. Of the 116 participants, 71% (83) scored in the minimal depression range; 20% (23) scored in the mild depression range; and 9% (10) scored in the moderate depression range. While comparing men and women, 82% (36) men and 65% (47) women scored in the minimal depression range; 18% (8) men and 21% (15) women scored in the mild depression range; and 0% (0) men

and 14% (10) women scored in the moderate depression range. Of the total sample, 59% (69) of the participants scored in the healthy nutritional intake range while 41% (47) scored in the poor nutritional intake range.

Table 1:

Mean BDI Score Standard Deviations, and F values for Gender and Nutritional Intake				
Variable	Mean	Standard Deviation	F-Ratio	Probability
Gender			12.77*	.07
Men	5.84	3.55		
Women	9.08	6.26		

A 2 × 2 factorial analysis of variance was used to analyze the data ($\alpha = .05$). The statistical results are presented in Table 1. As expected, the two main effects of nutritional intake (F1, 112 = 29.37, $p < .0001$) and gender (F1, 112 = 12.77, $p < .0005$) as well as the nutritional intake x gender interaction effect (F1, 112 = 6.04, $p = .02$) on depression were found to be statistically significant. Students with poor nutritional intake scored (M = 9.91) significantly higher on the BDI than students with healthy nutritional intake (M = 5). Also, as expected, women (M = 9.08) scored significantly higher on BDI than men (M = 5.84). However, this difference disappeared when men (M = 4.5) were compared to women (M = 5.51) with healthy nutritional intake as revealed by the Tukey/Kramer procedure ($t = 3.67, p > .05$) for the post hoc pair wise comparisons. Furthermore, the Tukey/Kramer procedure showed that the women with poor nutritional intake (M = 12.64) scored significantly higher on BDI than the other three subgroups: men with poor nutritional intake (M = 7.18; $t = 38.51, p < .01$), men with healthy nutritional intake (M = 4.5; $t = 36.00, p < .01$), and women with healthy nutritional intake (M = 5.51; $t = 16.19, p < .01$). (Table 2).

Table 2:

Variable	Mean	Standard Deviation	F-Ratio	Probability
Nutritional Intake			29.37*	.0001
Poor	5.00	4.29		
Healthy	9.91	5.76		
Gender × Nutritional Intake			6.04*	.02
Men/Healthy Nutrition Intake	4.50	3.41		
Women/Healthy Nutrition Intake	5.51	4.64		
Men/Poor Nutrition Intake	7.18	3.17		
Women/Poor Nutrition Intake	12.64	6.35		

*Statistically Significant

Discussion

As expected, it was found that the college students with poor nutritional intake tended to report significantly more symptoms of depression than did the students with healthy nutritional intake. This finding coincides with the findings of the earlier referenced study by Quick and Byrd-Bredbenner which also surveyed 18 - 26 year old students from three large American universities^[14]. This study examined the relationship between disturbed eating behaviors (such as binge eating, purging, dietary restraints etc.) and depression along with other psychographic characteristics. Although our focus differed from the study by Quick and Byrd-Bredbenner, both studies examined unhealthy aspects of students' eating. And both studies found that students who engaged in unhealthy eating behaviors scored higher on depression measures.

Our finding of women scoring significantly higher on BDI than men is in line with the previous research. However, when we introduced the variable of nutritional intake, this difference disappeared but only between women and men with healthy nutritional intake. And the difference became more pronounced and significant between women with poor nutritional intake and men with both healthy and poor nutritional intake. Of 72 women in the sample, 14% (10) scored in the moderate depression range while no men scored in this range. This rate of moderate depression surfaced even though all students who were under treatment for any psychological disorder were excluded from the current sample. This is a cause of concern and concurs with the concerns of the American College Health Association and National Institute of Mental Health presented earlier^[8-10].

In light of the current findings, the understanding of the issue of gender and depression link becomes more stirred. Our findings indicate that the variable of nutritional intake might be an intervening variable in the relationship between gender and depression of young adults. Our findings of no significant difference in depression between women and men when their nutritional intake was healthy, and significant difference in depression between women with poor nutritional intake (scoring higher) and men with both healthy and poor nutritional intake are intriguing. Further, not only women with poor nutritional intake had the highest mean BDI score (in the moderate depression range), but they also differed significantly in depression level from other three subgroups who scored only in the minimal depression range. Thus, it is concluded that the nutritional intake might have much greater impact on level of depression in women than men regardless of men's quality of nutritional intake.

College students face many challenges as they transit to college life including stressors of academic demands and adjustment to new environment. These changes are stressful and affect health related behaviors negatively. As such the nutrition is overlooked by students^[14]. They tend to eat on the go, eat many junk foods including alcohol, skip meals or develop disordered eating behaviors, party often and into the late hours and consume unhealthy foods due to peer pressure and so on. In current sample, 41% (47) of the participants scored in the poor nutritional intake range which is also of great concern. What should be done about it is a good question for the future research. Nonetheless, our findings highlight the need for further research to examine the nutritional needs of college students as well as developing educational and interventional programs at the college level that

will provide guidance and support while the students are facing the academic stressors. The Healthy People 2020 and 2015-2020 edition of the Dietary Guidelines by the U.S. Departments of Health and Human Services (HHS) and Agriculture (USDA) are important initiatives in the right direction at the national level^[10,21].

Despite the complexity of the issue at hand, it appears that the variable, nutritional intake has been overlooked by researchers while examining the gender and depression link, especially in young college students. Poor nutritional intake might be a greater risk factor for depression in young college women than men. Continued research is warranted with these variables. Although promising, the results of this study should be interpreted with caution because of the limitations of the sample of convenience and self-report measures.

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