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Depressed Women and Household Food Security Status

Research Article

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Abstract

Introduction: Household food insecurity (HFI) has become a major public health concern throughout the world. In addition, depression, as one of the main causes of disability, affects 350 million people worldwide. Given that both problems have a high prevalence, we investigated the relationship between depression and household food insecurity in this study.

Methods: In this case-control study, the status of food insecurity was compared between adult women with newly diagnosed major depression and healthy women in a 1-to-2 ratio. Major depression was diagnosed by a psychiatrist through a structured interview by diagnostic instrument DSM (Diagnostic and Statistical Manual of Mental Disorder), food insecurity was evaluated using HFIAS (Household Food Insecurity Access Scale) and other general data were gathered by a researcher-made questionnaire. We used SPSS, version18 to analyze data. The differences between quantitative and qualitative variables were examined by the t-test, ANOVA, and $\chi 2$ tests, and determining the odds ratio for depression between different degrees of food insecurity was performed by logistic regression.

Results: We observed a positive significant relationship between major depression and food insecurity so that the risk of major depression was 3.34 times higher in the severe food insecurity group than in the food security group (P=0.029). This relationship remained significant after adjusting for the confounding factors, including physical activity, number of children, and marital status.

Conclusion: It was observed a high prevalence of food insecurity in major depressed Iranian women.

Keywords: Household Food Insecurity (HFI); Depression; Major Depression Disorder (MDD); Women, Food Security

Introduction

Household food insecurity (HFI) has become a major public health concern throughout the world (1). According to the definition of FAO, household food security means that the family has access to a sufficient and diverse amount of safe food to meet the needs of its members for approximately one year; The per capita food basket of the family is correctly selected and prepared and is sufficient for the family members, and the family food is cooked correctly so that healthy elements and nutrients reach the cells and organs of the body (2).

On the occasion of World Food Day in 2022, FAO chose the slogan "Leave no one behind" to emphasize the provision of food for all, especially with the corona disease, climate change, international tensions, economic inflation, and rising prices of food (3). Over 852 million people around the world faced food insecurity (4) before the last pandemic and major depression disorder (MDD) is one of the main causes of disability in the world and affects 350 million people approximately (5). Evidence verifies the relationship between depression and household food insecurity (HFI). Even food insecurity has been suggested as a risk factor for depression (6-8).

Depressive disorder is one of the main causes of disability, which affects 350 million people worldwide (5). This common mental health disorder in Iran constitutes around 35 to 45% of mental health problems that cover 8% to 20% of the population of Iran (4). It affects one in six people in the United States and antidepressants treat 60–80 percent of depression cases and only less than 25 percent of all depressed patients receive drug therapy (6). Also, considering that medication compliance is low and the rate of recurrence is high (7) in depressed patients, nutrition-related factors can be considered in treating and preventing major depression. Whereas depressed mothers may be less able to plan, work, shop, and cook for their families. So maybe depression is a potential risk factor for food insecurity (8). Depression is more common in women than in men. For example, in Iran, women are 1.95 times more probable to develop MDD than men (9).

Therefore, we decided to conduct a case-control study to investigate the relationship between food security status and major depression in women. Given that we recruited new cases of depression, we may be able to determine which of the two mentioned problems starts earlier.

Materials and Methods

In this case-control study, the food insecurity status was compared between 72 newly diagnosed adult women with major depression (as the case group) and 143 healthy adult women (as the control group). Major depression was diagnosed by a psychiatrist through a structured interview with the diagnostic instrument DSM-IV (Diagnostic and Statistical Manual of Mental Disorder). Food insecurity and socioeconomic data were collected using the HFIAS (Household Food Insecurity Access Scale) and a general information questionnaire, respectively. Data were analyzed by SPSS18. Logistic regression was applied to determine the odds ratio for being depressed between different food insecurity degrees and socioeconomic status. The differences between quantitative and qualitative variables were examined by the t-test, ANOVA, and $\chi 2$ tests, respectively.

Study Population

This is a case-control study and the sample size was determined based on the prevalence of food insecurity in healthy women according to the pilot project that was conducted before the start of the main study. Accordingly, 72 adult women with MDD from two psychiatric clinics, Imam Hossein and Baharlu hospitals in Tehran, who has no chronic diseases and no pregnancy, no breastfeeding were selected as the case group. 143 adult women without depression from the same urban residential areas were selected as the control group. The matching was made based on age (age interval of 5 years) and the residential area of the women. Depression was diagnosed in patients by a psychiatrist through a structured interview and using the fourth edition of Mental Disorders (DSM-IV) (10) standardized in Iran (11) and all controls were screened using the Beck Depression Inventory 2 (12) to confirm being healthy. In addition, a general questionnaire was used to collect general information and data on medication use and some confounders.

Food Insecurity

Food insecurity was measured with the HFIAS 9-item questionnaire and the samples were classified into 4 food security groups, mild insecurity, moderate insecurity, and severe insecurity. The household food insecurity scale questionnaire includes 9 questions with Likert scale answers (most of the time, sometimes, rarely, and no). The lowest score for each question is zero and the highest score for each question is 3. The total points obtained by answering the questionnaire questions were classified into four scoring categories: food safety 0 to 1; mildly unsafe 2 to 7; moderate food insecurity 8 to 14; and severe food insecurity 15 to 27. This questionnaire was validated in Iran in a study conducted in 2019 by Mohammadi et al.(13).

Anthropometric Measurements and Physical Activity

Information about height and waist circumference was calculated using a tape measure with an accuracy of one centimeter, weight using a Seca digital scale with an accuracy of 100 grams, and body mass index (BMI) was calculated by dividing the weight in kilograms by height in m2. A classified physical activity questionnaire, based on the metabolic equivalent hours per day (MET-h/day), was utilized. This consists of nine levels of activity, from rest and sleep (MET=0.9) to vigorous activity (MET ≥6). The questionnaire has been prepared in previous studies in Europe and was validated with the daily physical activity questionnaire and the CSA Accelerometer (Model 7164 Ambulatory Monitor).30 Validity and reliability of the questionnaire have been confirmed in the study of Kelishadi et al. in Iran (14). A valid and reliable semi-quantitative food frequency questionnaire was applied to determine food intake in the previous 12 months (15). Data from the questionnaire was transformed into actual food intake (g/day).

Statistical Analysis

Statistical analyzes were conducted using SPSS (version 18). The comparison of qualitative variables such as marital status, level of education, and income was carried out using the K-square test, and the comparison of qualitative variables was carried out with the t-test and Mann-Whitney U in the case and control groups. In all stages of sampling, the consent of all participants (case and control) was taken into consideration and the participants were assured that their information would remain confidential.

Results

Moderate and severe food insecurity was more in the case group than in the control group. So 47.2% of the people in the case group had moderate and severe food insecurity; but in the control group, 24.8% of the people suffered from moderate and severe food insecurity, and this difference was statistically significant. The comparison of the mean score of food security in the case and control groups showed that food security in the case group is significantly lower than the control group.

Information on age, anthropometric characteristics, physical activity, number of children, and size of the household in the case and control groups according to food security status is shown in Table 1. For example, physical activity in the case group was significantly lower than in the control group. In the case group, the average age of the moderately and severely food insecure group was significantly higher than that of the food secure group ($P<0.05$). The number of children in the moderate food insecurity state was significantly higher than the number of children in the food secure group.

Also, the number of family members in the moderate insecurity group was significantly higher than in the mild insecurity group ($p<0.05$). In the control group, the mean age in moderate insecurity was higher than in the food security group. The number of children in the moderate and severe insecurity group was significantly higher than in the food security group. Marital status, income level, level of education, occupation of the head of the household, and birth rank in the case and control groups are summarized in Table 2, separately from the food security status.

A significant difference was observed between income, education, and birth rank in the 4 groups of food security in the case and control groups. So that in the case group, 62.5% of people with severe food insecurity had an income of fewer than 500,000 Tomans per month, and in the food security group, only 7.4% of these people had this amount of income. In the control group, 30.8% of people with severe food insecurity had an income of fewer than 500,000 Tomans per month, but in the food security group, 4.7% of people had this income.

There was no significant difference in the level of education in the 4 groups of food security in the cases, but a significant difference was seen in the control group; So that in this group, 54.5% of the people in the food security group had less than 12 years of education, but 88.8% of the people in the severe food insecurity group had this level of education.

The existence of a relationship between major depression and food insecurity was investigated using logistic regression, and it was shown that with the increase in the severity of food insecurity, the probability of depression also increased. It was significant, but by entering these variables into the regression model and adjusting their effects, only the relationship between severe food insecurity and depression remained significant and the effect of physical activity, the number of children, and marital status were observed to be confounding in the relationship between major depression and food insecurity (Table 3). The effect of physical activity in this relationship is negative, and it shows that increasing physical activity decreases the possibility of depression; But in the number's case of children and marital status, the effect is positive, and with the increase in the number of children or being widowed and divorced compared to being married, the probability of major depression increases.

Discussion

In the current study, 59.7% of the case group and 36.9% of the control group had food insecurity. In the initial crude model, Basic depression in adult women had a direct and significant relationship with the food security status of their households by food insecurity at moderate and severe levels. This relation remained stable only at the level of severe food insecurity after adjusting for the variables of age, household size, birth rank, number of years of education, marital status, body mass index, income level, and ownership status of a residential house. Piyab et al. (16) reported in a similar study that the prevalence of food insecurity in mothers is 50.2% and there is a significant direct relationship between household food insecurity and the mother's depression score. The results of the study by Layton Reesor et al. in 2021(17) also showed that there is a positive relationship between household food insecurity and maternal depression. Another study conducted by Merryn Maynard et al. in 2018 (18) showed that family food insecurity is positively related to poor mental health status among women. In the study conducted by Jones (19), depression and anxiety were also related to food insecurity, which is probably due to women's lack of certainty of continuous access to food sources in the present or future, which increases the risk of depression by creating stress. Unfavorable environmental conditions, low socioeconomic status, low level of education and age, unemployment, and living in a village cause food insecurity, which increases the risk of depression. Also, obtaining food through undesirable methods induces feelings of shame and guilt in a person. It is interesting to note that the relationship between food insecurity and depression is more than other socioeconomic factors such as job and educational status (20). Based on the findings of the Safarpour study (21), the incidence of depression was not significantly related to poor economic status and ownership of a home. These different results may be due to differences in the methodology of the study, the basic socioeconomic status of the participants, sample size, the definition of economic status, and different methods of diagnosing depression symptoms. Other risk factors for food insecurity include the problem of accessing food, disruption in daily food preparation, undesirable eating patterns, and having insufficient and low-quality food endangering mental health and increasing the risk of depression. In the present study, we also found that the level of education of women has an inverse relationship with the insecurity of household food. Such an inverse relationship has also been reported in previous studies on women (13, 16). Another finding of the current study is the relationship between the increase in the number of family children and food insecurity. A family which increases its number of children without increasing income, its food basket will become smaller, and finally, food insecurity will increase. Furthermore, with an increase in the number of widows and divorced women compared to married women, the probability of major depression increased, as was confirmed by the results of Farzaneh and Matheson's studies (22, 23). We also observed that the possibility of depression decreases with increasing physical activity; this finding was confirmed in the meta-analysis published in 2018 (24). This meta-analysis showed that doing endurance exercises significantly reduces depressive symptoms in adults. In another study (25), it was observed that physical activity is effective in improving mood, feeling charged, and regulating people's sleep duration (26). Another study in 2018 showed that almost any type of exercise, from cardio to

yoga, reduces the symptoms of depression (27). Another study in 2020 (28) showed that people with a low level of aerobic and muscular fitness are almost twice more at risk of depression.

Conclusion

In this study, we concluded that women living in food-insecure households were more likely to risk major depression. Most of these women were widowed or divorced, had less physical activity, and had more children.

Conflict of Interest

None.

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Tehran University of Medical Sciences

Ethics approval

The ethics committee of Tehran University of Medical Sciences has approved the study.

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