ORIGINAL ARTICLE

Socio-demographic Factors, Food Security and Mental Health Status among Mothers in Mentakab, Pahang, Malaysia

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ABSTRACT

Introduction: Women are vulnerable to food insecurity. This study aimed to determine the demographic factors, food security and mental health status among mothers in Mentakab, Pahang. **Methods:** This cross-sectional study was participated by 129 mothers aged 20 years to 59 years old. Mothers were interviewed to obtain information on demographic factors, food security status (Radimer/Cornell Hunger Scale) and mental health status (DASS-21). Chi-square and binary logistic regression were used to determine an association between factors and food security status. General linear model (GLM) was used to determine the difference in mental health score according to food security status group after controlling for covariates. Significance level was set at 0.05. **Results:** The mother's mean age was 38.30 ± 9.70 years. Prevalence of food insecurity was 55.8%. About 39.5% of mothers were depressed, 24.0% were experienced anxiety and 16.3% of mothers were stressed. The mean depression and anxiety score were 4.11 ± 3.54 and 2.96 ± 3.19 respectively. The mean stress score was 3.91 ± 3.44. Low household income (p<0.01) was increased the risk of food insecurity by nine fold. After controlling the covariates, there was significant difference in mean of depression score (p<0.01), anxiety score (p<0.01) and stress score (p<0.01) based on the food security status. **Conclusion:** More than half of the households were food insecure. Low household income was a main contributor towards food insecurity. Poor mental health status was associated with food insecurity. Lifestyle management and skills equipment need to arrange for mothers to improve their mental health status and socio-economic status.

Keywords: Food security status, Depression, Anxiety, Stress, Mothers

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INTRODUCTION

In line with the second of Sustainable Development Goals proposed by the United Nation, namely zero hunger, poverty and food insecurity problems need to be paid more attention. Food insecurity occurs whenever the availability or ability to acquire adequate and nutritious foods in socially acceptable ways are limited or uncertain (1). In the United States, prevalence of household food insecurity had increased from 10.7% in 2001 up to 14.9% in 2011(2). Several studies in Malaysia in both rural and urban area also reported prevalence of food insecurity. In Kuala Lumpur, about 65.7% of low income households were food insecure (3). In Kelantan, prevalence of food insecurity was higher in rural (Tumpat) than urban (Kota Bharu) areas which were 77.5% and 58.7% respectively (4).

Low monthly income is recognised as the main strongest predictor of food insecurity in all population. Low monthly income is associated with the reduction in the daily frequency and meal size (4). Further, low income persons were more likely to consume cheaper foods with low nutritional value due to the cheaper price (5). Besides that, previous studies reported other demographic background include living in a rented house (5) increased the odds of being food insecure as house rental would reduce the monetary sources (6). Other than that, low education level (5, 7) and occupation status (5, 8) are associated with food insecurity.

Adequate and nutritious foods play an important role in maintaining optimal health. Food insecurity was associated with malnutrition and adverse health outcomes in adult population (9, 10). Insufficient of food could lead to inadequate nutrition in adult women (11), lower physical performance among women elderly (12), multiple chronic condition and obesity in adults (13). Food insecure household tend to have low macro and micro-nutrient intake as well as consume low nutritious foods which contain high fat and sugar which contributes

towards poor nutritional status and chronic diseases. In addition, food insecurity also has been found to be associated with poor general health perception, poor mental and physical health among adults (10, 14).

Further, previous studies reported food insecurity has been linked to the poor mental health (13, 16, 17). This relationship can be explained by the stressor and mental health problems mechanism. Food insecurity was a stressor which an example of stressful life events and persistent of stressful life events induced the occurrence of depression. Food insecurity contributed towards stress, anxiety, irritability, emotional responsiveness, eating disorder and depression (15, 16) as the foods were consumed in socially unacceptable ways such as buying food on credits and participate in food assistance programme (1). Buying food on credits and participate in food assistance programme creates the feeling of shame and resignation which may develop the common symptoms of mental disorders (18).

Women were vulnerable to food insecurity (9, 19, 20). It might be due to the low socioeconomic status whereby women more likely to be living in poverty than men because they commit with low-wage job, and unpaid domestic work such as taken care for children, food provisioning and doing housework (21). Further, prior study found that unstable employment and earnings were related to food insecurity and poor physical or mental health (19). In Malaysia, several studies had been done on food insecurity (3, 4, 20). However, there was only one local study focusing on how it is related to mental health (29) among mothers. Previous local study (29) suggested that food insecurity contributed towards one of the quality of life domains namely mental health whereby an increase in one percent of food insecurity decreases the mental health score by 15.6. So, mental health is getting poor when the food insecurity becomes severe. Mental health status in this study involved three components namely depression, anxiety and stress. Thus, this study is important to determine the contribution of the demographic factors towards food security status and its association with mental health status among mothers in Mentakab, Pahang.

MATERIALS AND METHODS

Study and sampling design
This study was conducted at Kampung Penak in Mentakab, Temerloh, Pahang. Basically, there were 11 districts in Pahang and Temerloh district was randomly chosen among the districts. In addition, there were 10 sub-district in the Temerloh district and Mentakab sub-district was purposively selected in this study. It is due to the highest women population in Mentakab sub-district if compared with other sub-district based on the data shared by Council of Temerloh district, Pahang. There were 25 residential or villages in Mentakab. Kampung Penak was purposively chosen as study location due to

highest density of population. Kampung Penak consists of Traditional village (25 households), Taman Sri Penak (52 households) and Taman Penak Perdana (52 households).

All of Malaysian mothers from each household in Kampung Penak were invited to join this study as they were meet the inclusion criteria such as aged 18 years to 59 years old Malaysian female and free from mental health problems. None of the mothers met the exclusion criteria such as beyond the interest range of age (18 years to 59 years old) and reported been diagnosed with mental health problems by physicians. Mothers were asked on the mental health problems history prior data collection. In this study, the sample size was estimated by using the G*Power 3.1.9.2 was 82 respondents. However, minimum sample size required was 98 after added the 20% respondents for missing data response. Face-to-face interviewed on demographic factors, food security status, and mental health status was done. The ethical approval was approved by Ethics Committee for Research Involving Human Subjects Universiti Putra Malaysia (JKEUPM) with Reference No FPSK (EXP14-nutrition) U023.

Independent Variables
Demographic information that had been collected in this study was mother's age, ethnicity, mother's education level, marital status, number of children, household size, occupation, asset and household monthly income. Radimer/Cornell hunger scale developed by Radimer et al. (1990) (22) was used to determine the household food security status. There were 10 items in this instrument and these items indicate four levels of household food insecurity with increasing severity namely household food secure, household food insecure, individual food insecure and child hunger. First item to fourth item were household level items which indicates household food insecurity, fifth item to eighth item were adult level items which indicates individual food insecurity while ninth item to tenth item were child level items which indicates child hunger. Those who responded negative answers to all questions were categorised as food secure while those who responded positive answers to any of first to fourth items but not to fifth to tenth items were categorised as household food insecure. Those who responded positive answers to any of fifth to eighth items were categorised as individual food insecure and those who responded positive answers to any ninth or tenth item were categorised as child hunger. The Cronbach's alpha for Radimer/Cornell Hunger scale was 0.961.

Dependent Variable: Mental Health Status
Mental health status includes depression; anxiety and stress status among the mothers were determined by using Depression, Anxiety and Stress Scale (DASS-21) (32). It was a 21-item questionnaire which consists of three sub-scales to measure the negative emotional states of depression, anxiety and stress level. Each of

the three subs-scale consists of seven items and scores of depression, anxiety and stress were calculated by total up the scores of the relevant items. The mothers were asked to use 4-point frequency scales to rate the extent to which they experienced each state over the past week. The responses for the items were "not at all", "some of the time", "good part of the time" and "most of the time". In the context of the scoring, those who responded to "not at all" were given 0 score, those who responded to "some of the time" were given 1 score, those who responded to "good part of the time" and "most of the time" were given 2 and 3 score respectively. The Cronbach's alpha for DASS-21 was 0.963.

Therefore, in this study, demographic factor was treated as an independent variable of food security status. Meanwhile, food security status was an independent variable of the mental health status after controlling demographic factors (Figure 1). Basically, this framework was adapted from the conceptual Campbell framework (1991) which showed the factors and consequences of food insecurity. Based on the conceptual Campbell framework, the factors of food insecurity were not independent variables of the consequences of food insecurity. Therefore, the demographic factor was demonstrated as independent variable for food security status but not an independent variable for mental health status.

Data Analysis

The data was analysed by using the IBM SPSS version 21. Descriptive analyses such as frequency, percentage, mean and standard deviation were used to analyse all data. Chi-square test was used to determine the association between demographic factors and food security status. Further, binary logistic regression was used to determine the demographic factors that contribute towards food security status while General Linear Model (GLM) univariate analysis was used to determine the differences in mental health status score based on the food security status after controlling for household income, household size and years of schooling (Figure 1). The level of significant was set at 0.05.
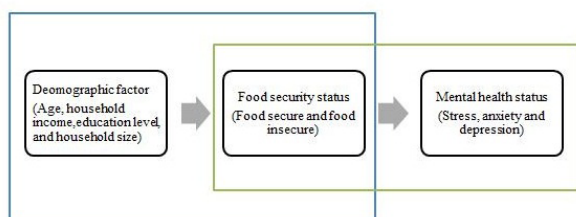

Figure 1: Research framework

—— : Factors of the food security status determined by binary logistic regression

—— : Difference in mental health score based on food security status after controlling demographic factors.

RESULTS

A total of 129 mothers agreed to participate which given the response rate of 100%. In overall, the mean age of the mothers was 38.30±9.701 years old (Table I). About 44.2 % of them were working as private employees, followed by housewife (38.8%), self-employed (9.3%) and the least was in government sector (7.8%). The mean monthly household income was RM 2149.61±802.50. For food security status, about 44.2% of household were food insecure whereby about 30.2% experienced individual food insecurity, about 7.0% experienced household food insecurity and 18.6% experienced child hunger. For mental health status, about 39.5% mothers experienced depression, while 24.0% and 16.3% of the mothers experienced anxiety and stress respectively.

Table I: Characteristics of the Mothers (n=129)

Variables	n (%)	Mean±(SD)
Age (years)		38.30±9.70
< 30	33(25.6)	
30-50	79 (61.2)	
>50	17 (13.2)	
Ethnicity		
Malay	89 (69.0)	
Chinese	16 (12.4)	
India	24 (18.6)	
Educational level		
Years of schooling		9.56±2.25
Primary school	32 (24.8)	
Secondary and post- secondary school	97 (75.2)	
Respondent's Occupation		
Government employees	10 (7.8)	
Private sector	57 (44.2)	
Self-employed	12 (9.3)	
Housewife/Not working	50 (38.8)	
Number of children		3 ± 0
≤ 3	72 (55.8)	
> 3	57 (44.2)	
Household size		5 ± 2
1-5	71 (55.0)	
6-10	58 (45.0)	
Household income (RM)		2149.61±802.50
< 2150	72 (55.8)	
≥ 2150	57 (44.2)	
Food security status		
Food secure	57 (44.2)	
Household food insecure	9 (7.0)	
Individual food insecure	49 (30.2)	
Child hunger	24 (18.6)	
Mental health status		
Depression	51 (39.5)	4.11±3.540
Anxiety	31 (24.0)	2.96±3.196
Stress	21 (16.3)	3.91±3.435

Demographic factors were found to be associated with the food security status (Table II). Older mother's age (χ^2= 8.684, p<0.05), low mother's education level (χ^2= 9.835, p<0.05), high number of children (χ^2= 11.958, p<0.01), low household income (χ^2= 36.464, p<0.01) and high household size (χ^2= 13.029, p<0.01) were significantly associated with food insecurity. Those who had household income below the mean was nine times more likely to be food insecure than those who had high household income (CI: 3.843, 21.487, p<0.01) (Table III). Therefore, amongst demographic and socioeconomic factors, low monthly income was the only factor associated with the food insecurity in this study.

Table II: An association between Demographic Factors and Food Security Status

Variables	Food Secure n (%)	Food Insecure n (%)	χ^2	p
Mother's age (Years)			8.684	P<0.05
<30	19 (67.9)	9(32.1)		
31-50	33 (39.3)	51(60.7)		
>50	5(29.4)	12(70.6)		
Ethnicity			1.728	0.421
Malay	37(41.6)	52(58.4)		
Chinese	10(58.8)	7(41.2)		
Indian	10(43.5)	13(56.5)		
Household Size			13.029	P<0.01
1-5	42(59.2)	29(40.8)		
6-10	15(25.9)	43(74.1)		
Household Income (RM)			36.464	P<0.01
<2150	13(22.8)	56(77.8)		
≥2150	44(77.2)	16(22.2)		
Number of children			11.958	P<0.01
≤3	42 (73.7)	30 (41.7)		
>3	15 (26.3)	42 (58.3)		
Education level			9.835	P<0.01
Primary & below	6(18.8)	26(81.3)		
Secondary & above	51(52.6)	46(47.4)		

Table III: Factors associated with food insecurity

Variables	Level	Odds Ratio (95% CI)	P
Household income (RM)	< 2150	9.087 (3.843, 21.487)	P<0.01
	≥ 2150	1.00	
Education level	Primary & below	2.083 (0.618, 7.021)	0.237
	Secondary & above	1.00	
Household size	1-5	1.00	0.197
	6-10	1.907 (0.715, 5.082)	

Further, there was significant difference in mean depression score based on the food security status after controlling the household income (F= 26.792, p<0.001). The mean of the depression score was significantly higher (5.50±3.39) among the food insecure than those

who food secure (2.35±2.91). Likewise, there was significant difference in mean anxiety score based on the food security status (F=14.264, p<0.001).Food insecure mothers significantly had higher mean anxiety score (3.86±3.59) if compared with the food secure mothers (1.82±2.16). Also, there was significant difference in mean stress score based on the food security status after controlling the duration of schooling among mothers and household size (F= 29.822, p<0.001). The mean of stress score was higher among the food insecure mothers (5.31±3.30) than food secure mothers (2.16±2.74) (Table IV). Therefore, food insecure mothers were associated with depressed, anxiety and stress even though after controlling the covariates.

Table IV: Difference in mental health score based on the food security status

Measurements	Food Secure (n= 57) (Mean±SD)	Food Insecure (n=72) (Mean±SD)	F	P-value
Depression[1]	2.35±2.91	5.50±3.39	26.792	P<0.01
Anxiety	1.82±2.16	3.86±3.59	14.264	P<0.01
Stress[2]	2.16±2.74	5.31±3.30	29.822	P<0.01

[1]GLM- adjusted for covariate- household income.
[2]GLM- adjusted for covariates- household size and years of schooling.

DISCUSSION

Women play an important role in taking care of the family. Adequate and nutritious foods were important for women in order to maintain the optimal physical and mental health status. The prevalence of food insecurity in this study was slightly lower (55.8%) than the other local study done (4). Norhasmah et al., (2011) found that the prevalence of food insecurity in Hulu Langat district, Selangor was 73.7% as the subjects were consists of welfare recipients, it might be due to the different study population whereby the previous study (4) was conducted among the welfare recipients which surely from the hard core poor and poor household.

This study consistent with the local studies (23, 27) and other abroad studies done by Townsend et al., (2001) (25) and Bartfeld et al., (2006) (26) which found that prevalence of food insecurity may decrease when the education of the respondents high. Furthermore, low educated individual usually had job with low wage. There was significant decreased in mean household income and income per capita when the food insecurity worsened (7). In this study, low household income was the main predictor of the food insecurity. Also, prevalence of food insecurity was high among the low income person as they engaged with many commitments including children's school expenditure, housing payment, transportation and household goods with limited budget.

Besides that, this study was in line with the study done by Piaseu (30) which found that food insecurity was

positively associated with the number of children. Majority of the food insecure household had six to ten family members (27). The increasing of the number of children as well as the household size will increase the household expenditure. Thus, high household expenditure with limited budget forced the mothers to buy low quality or non-nutritious food as these kinds of foods were cheap and affordable as well as prepare imbalance meal for their family. Further, the quantity of food consumed by per person in the household tends to be reduced as they need to share the foods with many people in that household.

Besides that, relationship between food insecurity and major depression among women has also been studied by several authors (16,17,28,29). In this study, there was significant difference in depression score, anxiety score and stress score among the food secure and food insecure mothers after controlling the covariates. Food insecure mothers tend to be more depressed, experienced anxiety and stress compared with food secure mothers. Food insecure individuals may experience depression due to lack of access to nutritious, affordable, culturally appropriate food and the inability to feed themselves and their families (27). Mothers felt down and emotional when they could not prepared nutritious and balance meal for their family as well as keep thinking the way to get money to buy food.

Food insecure mothers tend to experience distress (29). Stressful life events such as food insecurity and low socio-economic status were stressors that contributed to the onset of depression (33). Mothers suffer mental health problems because they are the one who prepare food and know the food situation in the household. Mothers experience deprivation and pride hurt when the food supply run out and tend to acquire food by inappropriate social ways such as buying food on credits or borrow money from others (18). This study reveals that food insecurity was significantly associated with mental health status after controlling the demographic factor that associated with mental health status.

However, this study only covered adult female population and did not represent the whole population in Malayisa. Besides, this study conducted in sub-urban area in Peninsular Malaysia and did not present other urban and rural areas in Malaysia. Further, this was cross-sectional study and cause-effect relationship could not be determined in this study. There many other unexplored factors of mental health status in this study. Future study on the food insecurity and mental health problems among the adult male is suggested. In addition, the longitudinal study design on the relationship between food insecurity and mental health status is recommended in order to gain deep understanding on the mechanisms of this relationship.

CONCLUSION

In conclusion, more than half (55.8%) of the households in Mentakab, Pahang was suffered from food insecure. Household income below the mean was a main predictor of food insecurity. Food insecurity associated with the mental health status such as depression, anxiety and stress among the mothers after controlling the demographic background. Besides that, the depressed mother should be referred for further management include health and lifestyle management such as stress management and mothers support group should be organized for women in order to improve their mental health. Furthermore, skills training among the mothers could be arranged to improve the income level among the mothers. Mothers can used the skills such as sewing, food services, crop and livestock management as a side income to increase the household income.

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