

## Factors associated with depression among adults in Mantin, Malaysia

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### Abstract

**Introduction:** Depression is a debilitating illness and has become a leading cause of disability worldwide. According to the National Health Survey IV, the prevalence of lifetime depression was 2.4% and current depression was 1.8%. In a review article published by the Department of Psychological Medicine, University of Malaya, the prevalence of depression in Malaysia was estimated to be between 8% and 12%. A cross-sectional study carried out in Selangor, Malaysia showed that 10.3% of adults aged 18 and above suffered from depression. Depression carries dire societal and health-related consequences that affect both the individual and the community as a whole, and is potentially a chronic illness with high morbidity, rate of relapse and recurrence. This study was performed to identify the prevalence of depression and factors associated with it.

**Method:** A cross-sectional study was done on 354 Malaysian adults above the age of 18 residing in the district of Mantin, Malaysia. Non-Malaysians and people with known-depression were excluded. A questionnaire was developed to detect the sociodemographic factors and Patient Health Questionnaire 9 (PHQ-9) was used to screen for depression.

**Results:** The proportion of the participants shown to score mild to major depression was 44.4%. Higher prevalence was found in individuals who were males (45.2%), in the age group of 38 years and below (48.3%), Malays (45.5%), having low levels of income (46.0%), having lower levels of education (45.7%), not married (48.1%), a parent (45.3%), having positive family history of depression (60%) and suffering from chronic illnesses (48.4%). Satisfaction with family members was a strong and independent factor associated with depression (OR 3.051, CI 1.445-6.444, p-value 0.002)

**Conclusion:** The prevalence of depression in the study population of Mantin was high and significantly associated with family satisfaction. Creating awareness regarding depression in this community is recommended. Projects and programmes encouraging individuals to connect with the family should be considered. In addition, policies should be put in place to promote more family time in the community.

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### Introduction

According to the Diagnostics and Statistical Manual of Mental Disorders V, major depressive disorder is characterised by discrete episodes of at least 2 weeks duration involving changes in affect, cognition, neurovegetative functions and interepisode remissions.<sup>1</sup>

The World Health Organization (WHO) estimates there are 322 million people now living with depression, an increase of 18.4% between 2005 and 2015. It can impair an individual's ability to function at work, school and in the family. At its worst, depression can lead to suicide. Close to 800,000 people die due to suicide every year. Suicide is the second leading cause of death in 15-29-year-olds.<sup>2</sup>

Depression is ranked as the fourth leading cause of burden among all diseases, accounting for 4.4% of the total Disability Adjusted Life Years (DALYs) and by the year 2020, it is estimated to be the highest ranking cause of burden of disease in developed regions and the second leading cause of DALYs lost worldwide, second only to ischaemic heart disease.<sup>3</sup> The Adult Psychiatric

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Morbidity Survey in England showed that 17.6% of the adult population met the diagnostic criteria for at least one common mental disorder, among which 2.6% of them had a depressive episode.<sup>4</sup>

The Centre for Disease Control and Prevention (CDC) of the United States of America (USA) reported that 9.1% of adults had some form of depression and 4.1% met the criteria for major depressive disorder<sup>5</sup> while the 2007 National Survey of Mental Health and Wellbeing in Australia found that 6.2% of Australians had an affective disorder, among which 4.1% of them had a depressive episode in the past 12 months.<sup>6</sup> A population survey in Iran found that 21% of the population had depressive symptoms.<sup>7</sup>

Closer to home in Malaysia, the National Health Morbidity Survey V (NHMS V) estimated that 29.2% of adults aged 16 and above are dealing with mental health problems which is a notable increase compared to 1996 when the prevalence was estimated to be 10.7%.<sup>8</sup> The National Health Morbidity Survey IV, reported that the prevalence of lifetime depression in Malaysia was 2.4% and current depression was 1.8%. The survey also found that depression was high in urban areas, among females, Indians, widowed, singles, divorced and those with lower education.<sup>9</sup>

Based on a cross sectional study conducted in three districts in the state of Selangor, Malaysia using the Public Health Questionnaire - 9 (PHQ-9), the prevalence of depression was found to be 10.3% of adults aged 18 and above.<sup>10</sup> Another cross sectional study by Sherina *et al* found 7.6% of elderly residing in Sepang, Malaysia to have depression and only employment status was found to be significantly associated with

depression.<sup>11</sup> A study by Wong *et al* showed the rate of depression among the rural community of the East Coast of Malaysia to be 11.3%.<sup>12</sup> A review article by Ng *et al*, 2018 estimated the prevalence of depression to be between 8% to 12%. The figures were higher among women of low socio-economic background and those with co-morbid medical conditions.<sup>13</sup>

According to the Malaysian Mental Health Advisory Council, there are 360 registered psychiatrists in the public and private sectors making the ratio of psychiatrists to the Malaysian population 1:200,000. This is far below the WHO recommendation of 1:10,000. Mental illness is also expected to be the second most common health problem affecting Malaysians after heart diseases by 2020.<sup>14</sup>

A 2005 study in Penang State has shown a high prevalence of severe depression among the older adults aged 60-69.<sup>15</sup> However, a more recent study by Tan and Yadav in 2015 found that depression was more common among young adults below the age of 25. The same study also found the prevalence to be 12.3% among the urban poor<sup>16</sup>, suggesting that socio-economic factors can also be a factor of depression. In addition, Tan and Yadav also found a higher prevalence of depression among males in the urban poor regions of Peninsular Malaysia compared to females<sup>16</sup>. However, the 2015 NHMS results stated that Malaysian females (30.8%) are more likely to suffer from mental health problems than males (27.6%), but it was not significant.<sup>8</sup> In terms of ethnicity, a study by Firdaus Mukhtar *et al.*, 2014 conducted in three different district of Selangor, found that the prevalence was the highest among the other ethnic groups (17.6%), followed by Chinese (13.8%), Malays (10.8%) and Indians (6.1%). The same study also found a significant

relationship between depression and marriage where the highest prevalence was among the divorcees (42.9%), followed by separated (33.3%), singles (14.0%), widowed (11.5%), and married couples (7.8%). In addition, they also found that 31.8% of the participants who were unhappy with their spouses, were suffering from depression.<sup>17</sup> Rashid and Tahir (2015) found depression to be higher among the elderly with just primary school education or less.<sup>18</sup> However, a Canadian Community Health Survey found lifetime depression to be more common among those with postsecondary education than those whose education level were lower than secondary school<sup>19</sup>. In terms of chronic illness, a study by Chew *et al.* (2016) on diabetic patients from three public health clinics in Seri Kembangan, Dengkil and Salak found the prevalence of any degree of depression to be 41.7%.<sup>20</sup> This is further supported by the study in Selangor, Malaysia where the prevalence of depression was higher among adults suffering from chronic illnesses compared to those who were not.<sup>10</sup>

Women who are infertile were found to have a strong association with depression.<sup>21</sup> Mothers with depressive symptoms reported higher levels of child behaviour problems; highlighting the significance of satisfaction on the subjects' children in contributing to depression.<sup>22</sup> In terms of family history of depression, the results of the studies were not homogenous. In a Genome-Wide Association Study (GWAS), they concluded there are genetic associations in a patient with depression<sup>23</sup>; this is contrasted with a study by CHARGE (Cohorts for Heart and Aging Research in Genomic Epidemiology), which demonstrated there are no genetic associations in depression in a larger pool of sample.<sup>24</sup> The study done by Siti *et al.* showed depression was significantly associated with subjects having unhappy relationships with their families.<sup>10</sup>

The aim of this study is to determine the prevalence of depression among Malaysian adults living in Mantin and its associated factors. Through understanding the factors associated with depression, the appropriate interventions and preventive strategies could be formulated to support individuals and groups at higher risk of developing depression.

## Methodology

### Study Design, Setting and Participants

Cross-sectional study with convenience sampling was done on Malaysian adults above the age of 18 residing in the 12 neighbourhoods in the district of Mantin, Malaysia. The total population of the 12 neighbourhoods was 33,523. The sample size was calculated as 354. Non-Malaysians and those who had been previously diagnosed with depression were excluded from the study.

### Study Variables

Independent variables that were evaluated to detect the association with depression were: age, ethnicity, gender, household income, education level, marital status, partner satisfaction, number of children, satisfaction with children, satisfaction with family, family history of depression and long-term illness.

### Study Instrument

The outcome variable was the depression status which was measured using the Patient Health Questionnaire 9 (PHQ-9).

A self-administered questionnaire was developed which had two sections. Section A included questions to detect the information for sociodemographic variables, family factors, socioeconomic variables and health status while Section B included Patient Health

Questionnaire 9 (PHQ-9) to screen for depression in the study population.

PHQ-9 is a self-administered tool that screens and measures the severity of depression in adult populations. It is a validated instrument used in primary care settings to screen, diagnose, monitor and measure the severity of depression. It has a sensitivity and specificity of 61% and 94% respectively. The severity of depression is categorised by scoring into none (0-4), mild (5-9), moderate (10-14), moderately severe (15-19) and severe (20-27).<sup>15</sup> The internal reliability of the PHQ-9 is excellent, with a Cronbach's  $\alpha$  of 0.89 in a primary care study.<sup>16</sup>

### Data Collection

Prior to data collection, the questionnaire was translated into Mandarin and Malay, then translated back into English to evaluate its clarity and uniformity of language. The uniformity of the language was checked by researchers afterwards. The questionnaire was pre-tested before actual data collection. The pre-tested data was discarded after preliminary assessment and never included in the final analysis.

Actual data collection was carried out by approaching participants using convenience sampling method. The participants were approached by going door-to-door in several neighbourhoods in Mantin and by approaching patients in Klinik Kesihatan Mantin. The participants were briefed about the study in either English, Malay, Mandarin or Tamil depending on the preference of the participant. A study information sheet was provided, and written consent was obtained on a consent form before administering the questionnaire.

### Statistical Analysis

The results of the categorical variables were expressed in terms of proportions. Chi-square test was applied for comparison of categorical variables. Odds ratio and its 95% confidence interval were used to study the strength of associations of categorical variables. Binominal multiple logistic regression analysis was used to study the independent effect of each variable over the outcome and removing the confounders.

### Results

#### Prevalence of Depression

The results showed that out of 354 respondents, 157 (44.4%) had a PHQ-9 score of 5 and above, who were considered to have positive screening for depression. Figure 1 shows the distribution of participants among score range groups. 197 respondents (55.6%) were reported to not have depression. Out of the 157 respondents who had depression, 111 (31.4%) had mild depression,<sup>31</sup> (8.8%) had moderate depression, 12 (3.4%) had moderately severe depression and 3 (0.8%) had severe depression based on the PHQ-9.

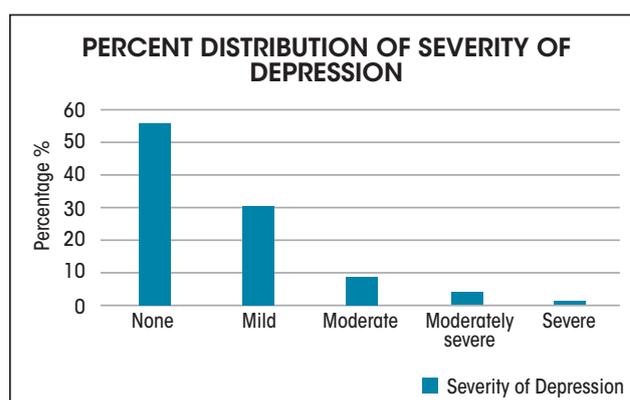


Figure 1. Percent distribution of severity of depression among the respondents

### Distribution of Characteristics of Participants

This cross-sectional study consisted of 208 female (58.8%) and 146 male (41.2%) respondents with an age distribution of 39 or higher (41%) and below 39 (59%). In terms of racial distribution, there were 143 Malays (40.4%), 114 Chinese (32.2%), 92 Indians (26.0%) and 5 others (1.4%).

Table I shows the distribution of characteristics of the respondents in the study. Among the respondents, a higher percentage of males (45.2%) were found to have possible depression compared to females (43.8%). However, the results were not statistically significant ( $p=0.786$ ). A higher percentage of participants aged 38 and below (48.3%) were found to have possible depression compared to those who were above 38 (38.9%). However, the results were not statistically significant ( $p=0.08$ ).

In terms of ethnicity, a greater percentage of Malays were found to have possible depression (45.5%) compared to non-Malays (43.6%). However, the results were not statistically significant ( $p=0.731$ ). In addition, more respondents whose income were below RM 3,000 had possible depression (46.0%) compared to those who earned RM 3,000 and above (41.4%). However, the results were not statistically significant ( $p=0.401$ ). Furthermore, a greater percentage of subjects who did not pursue a tertiary education were found to have possible depression (45.7%) compared to those who had (42.2%). However, the results were not statistically significant ( $p=0.527$ ). Among unmarried subjects, a higher percentage were found to have possible depression (48.1%) compared to married participants (42.2%). However, the results were not statistically significant ( $p=0.277$ ).

Furthermore, results concerning partner satisfaction showed among those who were unsatisfied with their partners, a greater percentage had possible depression (51.4%) compared to those who were satisfied (42.8%). However, the results were not statistically significant ( $p=0.338$ ). Also, more subjects who had children had possible depression (45.3%) compared to those who did not (42.7%). However, the results were not statistically significant ( $p=0.642$ ). Participants who were not satisfied with their children had a higher percentage of possible depression (46.4%) than those who were satisfied (43.3%). However, the results were not statistically significant ( $p=0.750$ ). Moreover, more participants with a positive family history of depression also had possible depression (59.5%) when compared with those with negative family history (42.6%). However, the results were not statistically significant ( $p=0.051$ ). In terms of long-term illness, a greater percentage of subjects diagnosed with chronic diseases showed possible depression (48.4%) than those without any long-term illness (43.0%). However, the results were not statistically significant ( $p=0.373$ ).

There is no significant relationship between depression and gender, age, ethnicity, income, education level, marital status, partner satisfaction, having children, children satisfaction, family history of depression or long term illness. However, there is a significant relationship between participants who were not satisfied with their family members (68.6%) and depression compared to those who were satisfied (41.7%) ( $p=0.002$ ).

### Correlates of Depression

Among all the correlates shown in Table II, a high risk of depression was statistically and significantly associated with satisfaction with family ( $p = 0.011$ )

Table I: Distribution of Characteristics of Respondents

Socio-demographic Variables	Depression Present n <sub>1</sub> (%)	Depression Absent n <sub>2</sub> (%)	Total Surveyed n	OR / RR (Unadjusted)	95%CI	p-value
<b>GENDER</b>						
Male	66 (45.2)	80 (54.8)	146	1.061	0.693-1.624	0.786
Female	91 (43.8)	117 (56.3)	208			
<b>AGE</b>						
38 years and below	99 (48.3)	106 (51.7)	205	1.465	0.955-2.249	0.08
Above 38 years	58 (38.9)	91 (61.1)	149			
<b>ETHNICITY</b>						
Malay	65 (45.5)	78 (54.5)	143	1.078	0.703-1.652	0.731
Non-Malay	92 (43.6)	119 (56.4)	211			
<b>INCOME GROUP</b>						
Below RM 3000	104 (46.0)	122 (54.0)	226	1.206	0.778-1.870	0.401
RM 3000 and above	53 (41.4)	75 (58.6)	128			
<b>EDUCATION LEVEL</b>						
Non-Tertiary	100 (45.7)	119 (54.3)	219	1.15	0.746-1.773	0.527
Tertiary and above	57 (42.2)	78 (57.8)	135			
<b>MARITAL STATUS</b>						
Married	94 (42.2)	129 (57.8)	223	0.787	0.510-1.204	0.277
Not Married	63 (48.1)	68 (51.9)	131			
<b>PARTNER SATISFACTION</b>						
Satisfied	98 (42.8)	131 (57.2)	229	1.415	0.694-2.887	0.338
Not Satisfied	18 (51.4)	17 (48.6)	35			
<b>NUMBER OF CHILDREN</b>						
No	56 (42.7)	75 (57.3)	131	0.902	0.584- 1.394	0.642
Yes	101 (45.3)	122 (54.7)	223			
<b>CHILDREN SATISFACTION</b>						
Satisfied	93 (43.3)	122 (56.7)	215	1.137	0.516-2.506	0.75
Not Satisfied	13 (46.4)	15 (53.6)	28			
<b>FAMILY MEMBER SATISFACTION</b>						
Not Satisfied	24 (68.6)	11 (31.4)	35	3.051	1.445-6.444	0.002*
Satisfied	133 (41.7)	186 (58.3)	319			
<b>FAMILY HISTORY OF DEPRESSION</b>						
No	135 (42.6)	182 (57.4)	317	0.506	0.253-1.011	0.051
Yes	22 (59.5)	15 (40.5)	37			
<b>LONG TERM ILLNESS</b>						
No	113 (43.0)	150 (57.0)	263	0.805	0.499-1.298	0.373
Yes	44 (48.4)	47 (51.6)	91			

\*Here, p-value of <0.05 was considered as significant.

**Table II: Multivariate Analysis: Correlates of Depression**

Correlates of Depression	Category	OR (adjusted)	95% C.I.	P-value
Age groups	Above 38 yrs	1	0.983-2.366	0.06
	38 yrs and below	1.525		
Satisfaction with family	Satisfied	1	1.257-5.828	0.011*
	Not satisfied	2.707		
Family history of depression	Present	1	0.275-1.179	0.129
	Absent	0.569		

\* Here, *p*-value of <0.05 was considered as significant.

## Discussion

### Prevalence

This study found that the prevalence of depression among residents with a PHQ-9 score of 5 and above was 44.4%. This result is high compared to the findings of a review article (8% to 12%) by the Department of Psychological Medicine, University Malaya<sup>13</sup>, in Selangor (10.3%) by Siti *et al*<sup>10</sup>, in Japan (3%) and the United States (16.9%) conducted by Andrade *et al.*<sup>25</sup> and the World Health Mental Survey 2011 conducted by the World Health Organisation (5%).<sup>26</sup> The high prevalence of depression in this population may be attributed to stressful household environments and negative relationships between family members.

### Factor Associated with Depression

#### Satisfaction with Family Members

Dissatisfaction with family members was significantly associated with depression. The results showed that respondents with family member dissatisfaction were 3.051 times more likely to have depression compared to those who reported that they were satisfied with their family members (OR= 3.051, CI= 1.445-6.444,

*P*= 0.002). This is supported by a study done by Siti *et al* which also showed depression was significantly associated with people in unhappy relationships with their families (OR= 5.2 , CI= 3.91-6.92, *P* =0.001 ).<sup>10</sup> A possible reason for this finding is the daily cumulative interactions with family members which ultimately contribute the most to an individual's mental wellbeing. This suggests that families are the very core of the human condition and the relationship between individuals in a family can largely shift a person's mental wellbeing in both tangents.

### Other Independent Variables and Depression

#### Gender

Depression was more prevalent in males compared to females. (OR= 0.943, CI= 0.616-1.443, *P*=0.786). There was no significant relationship statistically between the results collected with regards to gender as a factor for depression. On the contrary, a study conducted by Ethiopia National Health Survey showed that the number of female candidates who suffered from depression was higher than male candidates.<sup>27</sup> This could be associated with the hormonal changes in women during fertility, pregnancy and menopausal period.

## Age

The results showed that respondents aged 38 years and below were more likely to get depression than those who were aged above 38 years (OR= 0.682, CI= 0.445-1.047, P=0.08). There was no a significant relationship between the results collected with regards to age as a variable. Ethiopia National Health Survey demonstrated that the risk of depression increases with age, which contradicts the results found in Mantin.<sup>27</sup>

## Ethnicity

Malays were more likely to have depression than non-Malays (OR= 0.928, CI= 0.605-1.422, P=0.731). However, there was no significant relationship between the results collected with regards to ethnicity. The results of this survey contradicts a study carried out in Selangor, Malaysia where the study showed that the prevalence of depression was highest among Chinese (13.8%) followed by Malays (10.8%) and Indians (6.1%).<sup>10</sup>

## Income Group

Participants whose income was below RM,3,000 per month were more prone to develop depression compared to those with a monthly income of RM 3,000 and above. (OR= 0.829, CI= 0.535-1.285, P=0.401). However, there was no significant relationship between monthly income and depression. A study in Canada showed a positive correlation between the amount of household income and depression. The highest prevalence rate of lifetime depression was seen in households with an income level of less than \$10,000 per year.<sup>19</sup> This may be caused by difficulties faced by individuals from a lower income group to fulfil their basic needs and provide for themselves & their families.

## Education Level

Individuals without a tertiary level education were found to have a higher risk of developing depression compared to those who completed tertiary level education and above. (OR= 0.870, CI= 0.564-1.341, P=0.527) There was no significant correlation between depression and education level from this study. Individuals with a lower level of education tend to settle for low paying jobs which may cause them to face financial difficulties. This may explain the relationship between depression and education level. In contrast, according to the Canadian Community Health Survey, respondents whose education level were lower than secondary school had the lowest rate of lifetime depression and the highest rate of lifetime depression was seen among those with "other post-secondary" education.<sup>19</sup>

## Marital Status

Based on the data collected from this study, respondents who were not married had a higher risk of developing depression than those who were married. (OR= 1.271, CI= 0.824-1.962, P=0.277). The result shown that there was no significant correlation between marital status and depression. Based on a study conducted in Selangor, Malaysia, the results revealed that depression was more prevalent among divorcees compared to those who were separated, single, widowed and married couples.<sup>10</sup> This may be due to the emotional support provided by a partner and the psychological stress of experiencing a divorce.

## Partner Satisfaction

In this study, the results revealed that respondents who were not satisfied with their partners were more likely to be depressed compared to those who were satisfied with

their partners. (OR= 0.707, CI= 0.346-1.441, P=0.338). This variable showed no significance in this study. A research done on 1751 Canadian adults indicated that those who were dissatisfied with their living partner had higher levels of depressive symptoms.<sup>19</sup> In a study done on older Europeans, the results showed that respondents who experienced widowhood report significantly more depressive symptoms than those continuously married.<sup>28</sup> A possible reason is partner dissatisfaction may compromise the emotional support in a relationship, thus increasing the risk for depression.

### Children

In this study, respondents who had children were more likely to be depressed than those who did not have children. (OR=1.109, CI= 0.718-1.713, P=0.642). These findings were not significant statistically. These results contradict the findings of one study, which established a significant association between depression and infertility in women.<sup>21</sup> However, depression in that study may have been derived from the fact that the women were infertile, and not just because they had no children.

### Children Satisfaction

In this study, the respondents who were not satisfied with their children were more likely to be depressed compared to those who were satisfied. The results, despite not showing apparent significance (OR= 0.880, CI= 0.399-1.938, P=0.750), complements the findings of a study correlating high levels of anxious and depressive symptoms by parents whose children are suffering from cystic fibrosis.<sup>29</sup> Accordingly, a study done with 43 mothers with school aged children suggested that mothers with depressive symptoms reported higher levels of child behaviour problems<sup>22</sup>, indicating a correlation between depression and children dissatisfaction. A

possible reason is children dissatisfaction may place more stress on the parents, thus increasing the risk for depression.

### Family History of Depression

According to this study, the respondents who had a family history of depression were more likely to be depressed compared to those with a negative family history of depression. (OR =1.977, CI= 0.989-3.954, P=0.051). The results showed to be not significant. However, there are major debates and controversies regarding the topic of depression and genetics. For example, in a GWAS done by the CONVERGE consortium, they identified two genetic associations by focusing on a sample of Chinese women with recurrent severe depression.<sup>23</sup> However, a different consortium under CHARGE conducted a similar GWAS study with a larger cohort of 30,000 people and failed to identify any genetic associations with depression.<sup>24</sup> This may be due to the limited technology in the study of genetics, which makes it difficult to establish an association between genetics and depression.

### Long-term Illnesses

Long-term illnesses are one of the attributable risk factors to the development of depression among Malaysians. Based on data collected from the respondents, those with long term illnesses were more likely to be at risk of getting depression than those without long term illnesses (OR= 1.243, CI= 0.77-2.005, P=0.373). There was no significant relationship between long-term illnesses and depression in Mantin, Malaysia. According to a research carried out in Selangor, Malaysia, the prevalence of depression was higher among adults with chronic diseases compared to those without any chronic disease.<sup>10</sup> In addition, data provided from the

WHO World Health Survey among 245,404 adults aged 18 years and above found that significant decrement in health is associated with depression.<sup>30</sup> The lifestyle changes and altered view of oneself may be the most likely reason for the positive correlation.

### Implication of the study

Based on the interpretation of the results, family satisfaction has a significant association with depression. Thus, involving family members while treating a patient can result in a better outcome compared to treating the patient with medications and psychotherapy alone. Furthermore, educating the public about the importance of family can bring awareness to the people regarding the link between family satisfaction and depression. This may lower the prevalence of depression in the general population. Lastly, employers can reduce the working hours of their employees, hence giving them more time to spend with their families, thus lowering the chances of getting depression.

### Limitations

Due to time constraints, the study was done on a small sample of the population using convenience sampling method which might not be a true representation of the population. Secondly, convenience sampling method was used due to the language barrier and time limitation. Lastly, since this survey was done in the community clinic and residential areas of Mantin, the study could not cover certain demographics such as working adults who were away from home during data collection time.

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